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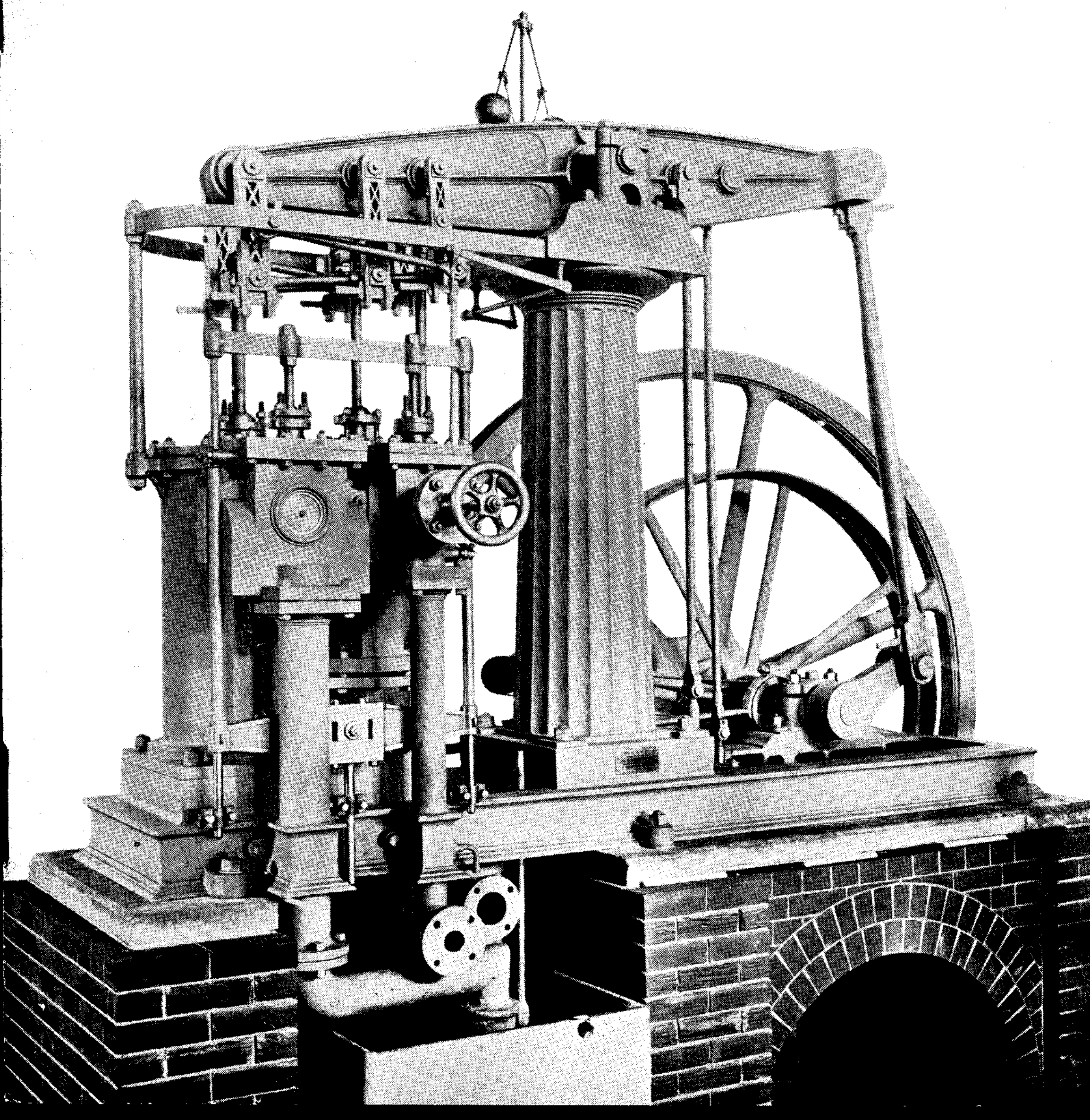


The MODEL ENGINEER

PERCIVAL MARSHALL & CO. LTD., 23, GREAT QUEEN ST., LONDON, W.C.2

7TH AUGUST 1952 VOL. 107 NO. 2672

SMOKE RINGS

Our Cover Picture

● THIS DOUBLE-ACTING compound beam engine was made by Thomas Horn, of Westminster, about 1860 to drive a flour mill at Ifield, Sussex, and was in use till 1914. The general arrangement is that of the double cylinder or compound single-acting engine of Jonathan Hornblower, patented in 1781, and constructed by him in 1782 and 1790.

Probably Hornblower hoped, by using first a small cylinder to reduce initial condensation and by expansion in the larger one, to effect as great economy as Watt did with a single cylinder and separate condenser. The condenser was, however, present in Hornblower's engine and he was stopped by Watt for infringement. In 1804 Woolf repatented the compound engine to get a large number of expansions and built many engines. Compounding did not persist, however, for it was found that with the boiler pressures then usual, no great economy could be obtained with the single-cylinder Cornish engine. Compounding existing beam engines was practised by John McNaught successfully from 1845 onwards. The rise in boiler pressures was slow, but about 1850 the compound engine both at sea and on land became established.

The framing of this engine is a cast-iron bed plate and central column. The beam 8 ft. centres and the crank are also of cast-iron. The cylinders are side by side, the low pressure one being furthest from the beam centre. The high pressure is 8.25 in. dia. by 17.74 in. stroke, the low pressure 16 in. dia. by 26 in. stroke. The drive is through a parallel motion pantographically extended to take both the high-pressure piston-rod and the air pump-rod. The valves are of Murray's box type, both being hung from a frame actuated by a countershaft from an eccentric on the crankshaft ; the travel is 2 in. A Watt governor controls the steam by a throttle valve.

The condenser is of the continuous jet type in a cast-iron tank or hot well below the bedplate, the air pump is 15 in. dia. by 13 in. stroke. The boiler feed pump is a plunger 1.75 in. dia. by 8.3 in. stroke, similarly worked off the beam. A lift pump for condenser water, also marked from the beam (only the rod retained), drew from a well 80 ft. deep under the crankshaft. The flywheel is 10 ft. dia. and the power was taken off from a belt pulley 6.5 ft. dia. by 7.75 in. wide instead of by gearing, the usual practice.

The boiler pressure was 40 to 45 lb. per sq. in., and with a speed of 45 to 50 r.p.m. the engine would exert about 16 h.p.

This engine was presented by members of the Newcomen Society for the study of the history of engineering and technology.

Crown Copyright. From an exhibit in the Science Museum, South Kensington.

Model Tramway Exhibition

● THE TRAMWAY and Light Railway Society announces that it will be holding a " Fifty Years of Electric Tramways " Exhibition at the Royal Scottish Corporation Hall, Fetter Lane, Fleet

Street, London, E.C.4, on Friday and Saturday, August 15th and 16th. On the first day, the times of opening will be 5.30 to 9 p.m., and on the second day 11 a.m. to 9 p.m. Most of the models to be shown are $\frac{3}{4}$-in. scale and will be running. Tickets of admission, price 1s. 6d. for adults and 9d. for children, can be obtained in advance from Mr. T. A. Gibbs, 30, Chandos Avenue, Whetstone, N.20.

The "Simplicity" Roller

● THE PHOTOGRAPH of the Wallis & Steevens inclined-boiler steamroller published with a "Smoke Ring" on July 10th brought a prompt and friendly letter from Mr. Edmund Gill, of Gill & Dudman, the Hemel Hempstead contractors and specialists in road construction. Mr. Gill writes :—

"We were interested to read in your publication of July 10th of the small road roller with steeply inclined boiler and note that you stated you thought this to be the only one of its type at work.

"You will no doubt, however, be pleased to know that we too have the same make of roller which is still giving excellent service."

This is interesting ; and it also gives the direct answer to another correspondent who wrote, anonymously, to inform us that there is no doubt about the one in our photograph being the only one now at work, since it was the only one *ever built* ! We knew better than that, because we can recall noting more than one specimen in the London suburbs many years ago. They were known as the Wallis & Steevens "Simplicity" type road rollers.

A Nice Afternoon

● THE READING Society of Model Engineers organised a rail tour on Sunday, July 20th, and we had the pleasure of accompanying the party. A diesel railcar was provided for the purpose by British Railways, Western Region, and the programme was carried through without a hitch. Leaving Reading at 1 p.m., we took the West of England main line to Newbury, where some shunting was necessary in order to get us over to the Lambourn Valley line. We then proceeded up the valley to a 20-minute halt at Welford Park, where the station, sidings and signal-box were inspected. Then on to Lambourn, where there was more inspection of the station and equipment, which, this time, included locomotive facilities but no running-shed.

The car was now reversed and took us back to Newbury, whence we passed on to the Didcot-Newbury line and ran to a scheduled stop at Compton. After seeing all that was to be seen there, we went on to Oxford, via the east curve at Didcot. At Oxford, the car was again reversed and took us back to Kennington Junction where we were put on to the single-line branch to Princes Risborough via Thame.

We made a stop of nearly an hour's duration at Thame while the party took tea, during which the old station, with its all-over roof, was the subject of much discussion. We then proceeded to Princes Risborough where we arrived to witness the passing of the 5 p.m. express from Birmingham to Paddington and, as we thought, the 6.10 p.m. from Paddington to Birmingham. The latter train, however, was duplicated, so we had the satisfaction of seeing three instead of two expresses ; each was hauled by a "King"-class engine and travelling at high speed, providing us with appropriate thrills !

After this, we proceeded to High Wycombe, thence on to the branch to Maidenhead where the car was once more reversed for the last lap to Reading, reached at 8.10 p.m. It was a most enjoyable trip of about 70 miles all told, mostly through charming scenery, especially in the Lambourn Valley ; to the railway enthusiasts, it was full of interest, from start to finish. The cameras had a busy time of it !

The North London Exhibition

● THE NORTH London Society of Model Engineers announces that its exhibition this year will be held from August 11th to the 16th at St. John's Hall, Friern Barnet Lane, Whetstone. We would call the attention of readers to the change of venue, and we believe that the new site possesses certain advantages that the old one did not have.

However that may be, all readers who can possibly get there are sure to find a good show ; the members are exerting every effort to ensure its success. As the chairman of the society rather aptly expresses it, the exhibition affords an opportunity for all members to view and discuss each other's work and to make their aims and work known "to those less fortunate members of the community who are not yet model engineers."

That is a very good way of putting it, and we take this opportunity of commending it to the notice of other societies.

Obituary

● OUR READERS will learn with regret of the death of Dr. C. Nepean Longridge, who passed away on July 13th after a long illness. Dr. Longridge is known throughout the modelling world for his fine models of the *Cutty Sark* and H.M.S. *Victory*, both of which he has given to the Science Museum, South Kensington. The models are to the scale of $\frac{1}{4}$ in. to the foot, and are very completely detailed. In each case they were first exhibited at the "M.E." Exhibition. Dr. Longridge was very friendly with the late Percival Marshall, the outcome of this friendship being the publication of the well-known book on the *Cutty Sark*, which was published in two volumes some years before the war. For some years before his death, Dr. Longridge was engaged on an important book on Nelson's ships, which includes a detailed description of the *Victory* and of his model. Although he was well aware of the outcome of his illness, nothing could subdue his indomitable spirit and he worked on his book to the very end, completing the correction of the proofs of the index only a few days before his passing. Dr. Longridge has made a notable contribution to the craft of ship modelling, in both his models and his books, and his name will live in the memory of model makers for many years to come.

THE 1903 "GORDON BENNETT" MERCEDES

A reasonably accurate scale model built as a three dimensional portrait of a car that made motor racing history, and as a change from rail and cable racing

by Major T. W. Stubbs

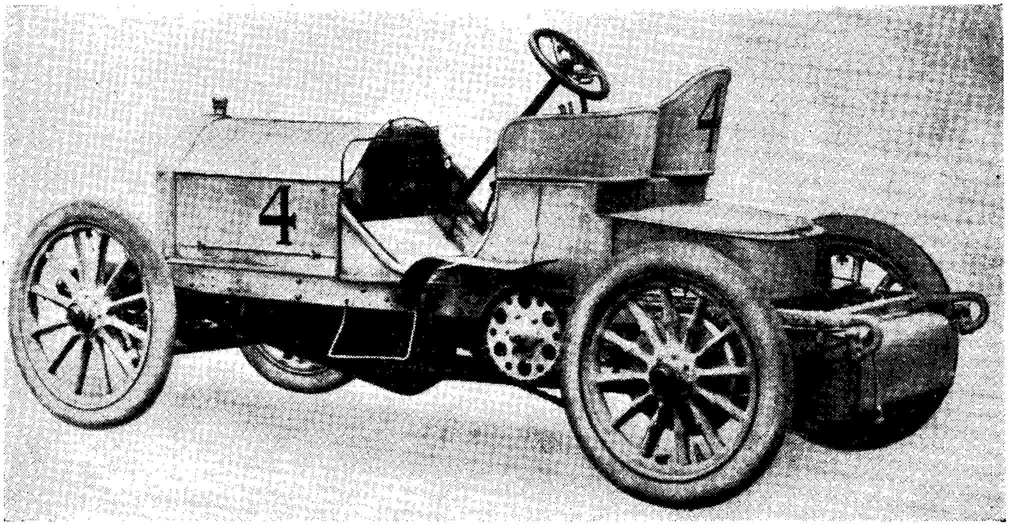
IN the very earliest editions of *Model Car News*, W. Boddy made numerous appeals for accurate scale models of cars of the earlier years. No one can deny the appeal of the sleek, low-slung moderns, the Alfas, Ferraris, and the B.R.M., and that appeal, plus the urge for sheer speed, has caused a glut of models with inaccurate outlines and a complete dearth of real details.

As a serious student of motor racing, it became very apparent to me that a model of one of the early Edwardian giants just had to be built.

The two main problems in building such a model were chains, sprockets and a suitable slow-running engine, preferably a water-cooled side-valve. Next on the list came the problem of what car to model, and where to obtain detailed drawings when that decision was made. Lucky for once, a sudden posting uprooted me from England and dumped me firmly in Germany. It did not take an awful long time to get in touch with one or two pre-war chums at the Daimler Benz factory, and in a very short time both choice of model and the provision of the drawings were things of the past.

The 1903 Gordon Bennett trophy winner was the obvious choice, as this car had all the desirable veteran features, plus a fascinating history, and a bit of detail was available in spite of the attentions of the Royal Air Force in '44. However, detailed information was not too plentiful and considerable research had to be undertaken before any working drawings could be made.

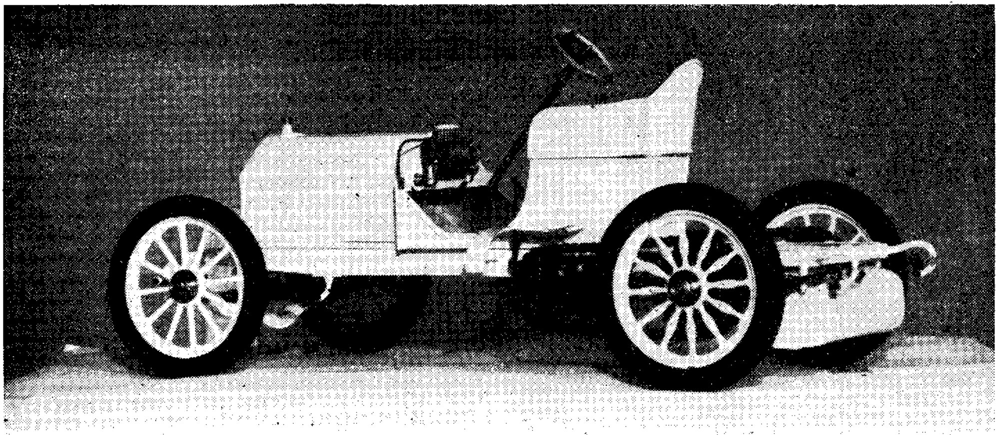
The three cars originally intended for the race were 90 h.p. monsters, but, unfortunately, a disastrous fire at the factory removed all chance of these cars ever getting to the starting line.



A photograph of the original Daimler Benz car just before the race. Numbers are painted on, but the box-like structure was removed before the car went to the starting line

An appeal was launched by the firm, three newly-built 60 h.p. touring cars were loaned by their generous owners and rapidly converted into racing machines. The time factor precluded any very special modifications and it is fairly safe to assume that the only tuning done was to fit new and lighter bodywork, a well-known form of "tuning" often indulged in by the "flashy" types of both model and full-size cars.

After weeks of poring over photographs and drawings, sufficient detail was obtained with which to make a reasonable start. The scale was automatically fixed by the chain available, and as good fortune had delivered into my hands a length of 5 mm. pitch roller chain, the model had to be one-eighth full size. This tied up quite well with Meccano large-size tyres, gave a fair amount of underbonnet space, and made the split-pinning of all but the very smallest nuts possible. One other very important factor also came into the picture. The model had to be almost pure kitchen table, as workshop facilities



Compare this view with the photograph of the original taken just prior to the race, and remember that the box-like structure at the back was removed before the start

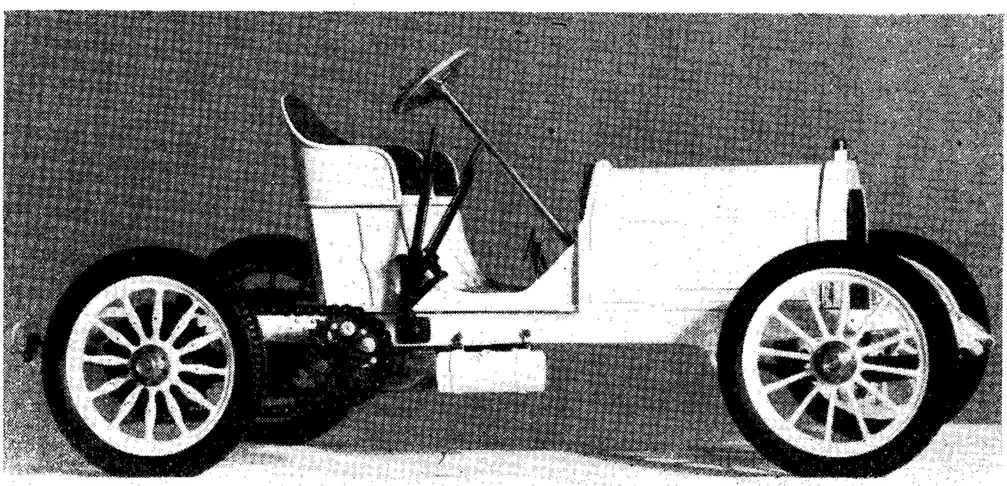
were practically nil and any complicated machining was out of the question.

The scale of one-eighth full size demands that all major details are accurately reproduced. On a non-working model, this is not altogether easy, but, on a powered job it becomes something of a major problem. For instance, on most early cars castellated nuts and split pins appeared all over the place, bodywork and bonnets were literally full of rivets, and the more intimate bits of machinery, these days carefully hidden, were exposed unashamedly, to the public gaze.

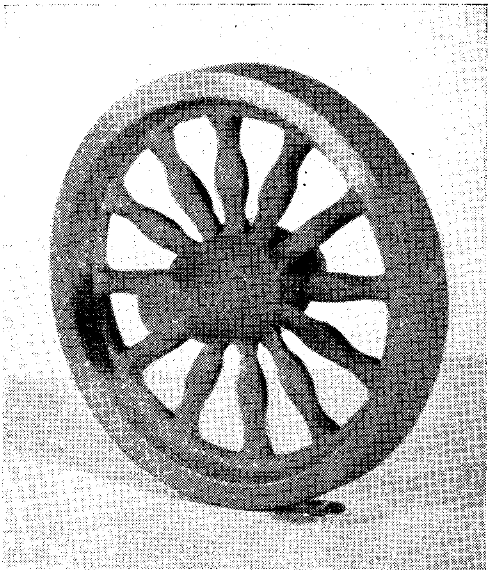
All this proved an added attraction and the contemplated expenditure in fine drills was totally offset by the thought of seeing rows, and rows, of nicely split-pinned nuts.

Further weight to the balance in favour of veterans was added by the vision of the array of polished brass on the dashboard and the prospect of seeing huge graphited sprockets and chains, and a large diameter exhaust pipe that emitted the correct sound and smells.

As in big car practice, the chassis was started first. This item consists of a pair of channel section side members with a pronounced kink just forward of the centre. Side members were formed by bending light gauge tin plate over a hard wood former and finishing by the "snip and solder" method. As only two cross-members were fitted to the original, something had to be done to increase the rigidity of the rather fragile framework. To this end an aluminium baseplate was flanged up to a dead fit between the side girders. This plate was cut away to clear the engine, flywheel and clutch, etc., and finally fixed into place by 12-B.A. round-headed bolts with the heads filed down to represent the rivets of the original. "J" hangers for the front springs and the graceful,



The most interesting side of any old-timer ; it must be the hand-brake and gear lever that proves to be such an attraction



A fret saw, plywood and patience produced the pattern; a lathe would have been a great help had one been available

goose-necked rear shackle supports were made by the simple process of silver-soldering a "T" head on some round brass rod, then carefully bending and filing to shape. These hangers were sweated into place, and finally riveted with scale rivets.

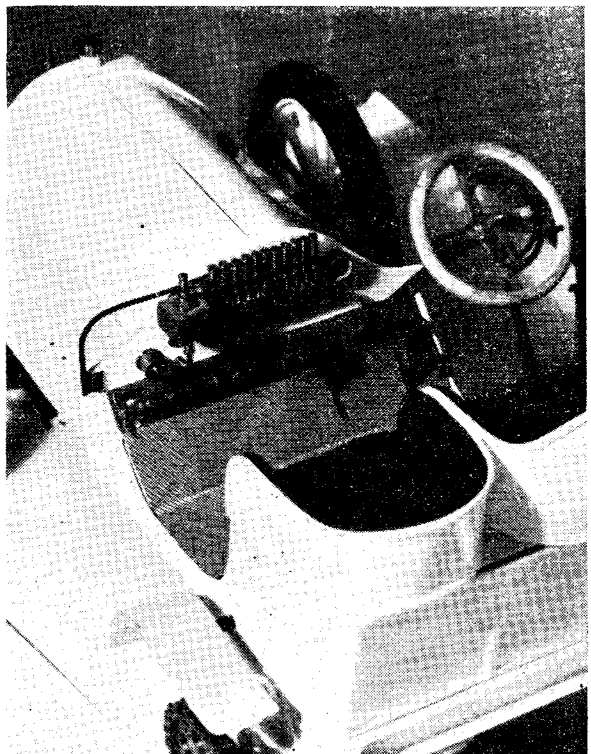
By this time the Electra right-angle drive unit had arrived and it was possible to go ahead with the bearings fitted to the chassis members, and the brackets, formed integrally with the bearings, that support the fore end of the rear spring shackles. These were fabricated from sheet and tube brass, silver-soldered together, cleaned up and drilled 3 : 2 for the lower shackle pins. All shackles, by the way, were filed from mild-steel and proved quite an exercise, an exercise, however, that served to brush up filing ability, neglected for a number of years. The chassis now began to look something like and all the rivets were accurately located, a job calling for quite a lot of checking and re-checking to ensure that the spacing and arrangement was as accurate as the scanty information permitted.

Rivets of sufficiently small dimensions for the fuel tank were not available, so the ever-handy Eclipse centre-pop was brought into play and a sheet of light gauge tin plate marked out and "riveted" by the simple expedient of punching on to a sheet of hard aluminium. The resultant "rivets" were both life-like and of correct proportions; this same method was used on the bonnet as well. The castellated filler cap was filed out from brass tube, fitted into place and polished. When completed, the tank was bolted into place with 10-B.A. hexagon-headed bolts and the whole assembly sprayed white. Great care was taken to keep the coats of paint as thin as possible to prevent the rivets becoming oversize in appearance.

Bodywork, bucket seats, dashboard, bonnet and radiator were simple soldering exercises, with half-round brass beading sweated into place. Floor boards were made from aluminium foil, scored to represent the "pyramid" section alloy sheet of the original, and "bosticked" to thin plywood.

The dashboard was cut from $\frac{1}{8}$ in. thick alloy and bolted to the front of the "body," a narrow metal fillet was formed from tinplate and fixed into place on the engine side of the dash to act as a seating for the bonnet. Then came the drip feeds, quite a battery of these, air pump, oil tank, and pressure gauge.

All these were built up from scraps of brass tube and a selection of 10- and 12-B.A. nuts and bolts, carefully soldered together and polished. Most of the turning was done in a hand drill with needle



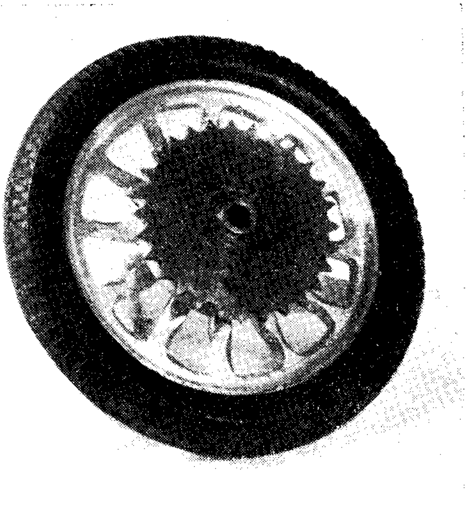
The completed dashboard and instruments. The wooden-rimmed steering-wheel is correctly built in four sections. On the original car the throttle was controlled from the central quadrant on the steering-wheel, hence only two pedals on the floor

files as turning tools ; later my Wolf drill arrived and matters were further simplified.

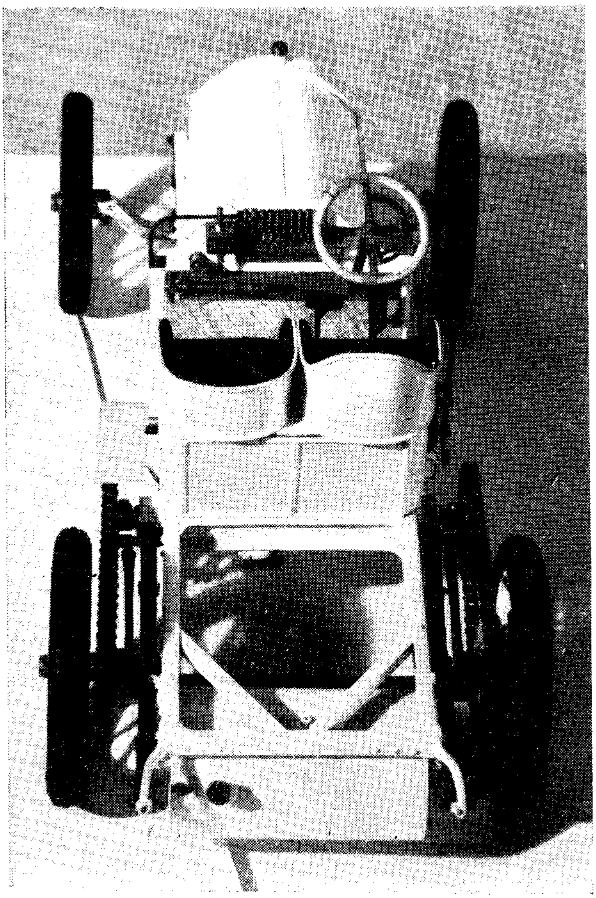
All the chassis and bodywork completed, the springs, made from hacksaw blades, were fitted into place, wrapped with sticky tape for protection from the cellulose, and then spraying began.

One thing was well and truly learned about painting accurate and detailed models. They must be really highly finished before the first lick of paint goes on, and in the case of models where tiny bolts, rivets, or other minute protrusions break up a flat surface, rubbing down must be kept to a minimum, or else all detail will be lost. Three coats of really thin cellulose will make correctly scaled rivets go appallingly oversize, and hexagon-headed bolts to lose shape.

Axles gave cause of a certain amount of thought. No machinery was available to mill them to correct " I " section ; building up might have filled the bill, but it was finally decided to cast them in alloy and finish off by filing. Ply and balsa wood patterns were made somewhat oversize except for the channel, cast, and duly filed up. The " dead " stub axles for the rear were turned up in mild-steel (by a German fitter who showed great interest and charged only a few pence) and the torque arms cast in brass. Front stub axles were again filed and silver-soldered from mild-steel and the wheel bushes lapped to a nice running fit.



Rear wheel and sprocket. The wheel at this stage was unfinished, as indicated by the square section of the spokes



Bird's-eye view. Dashboard details are clearly shown, as is the chain-guard over the sprocket and chain on the " mechanican's " side. This was an absolute " must," as he sat most of the time on the floor boards

Then came the wheels. Any ideas that may be cherished as to the utter simplicity of wooden wheels can now be abolished.

On the majority of the early chain, and often shaft drive, vehicles, the spokes of the rear wheels were of totally different shape to those of the front. Front wheels spokes were chamfered to conventional eliptical section and were practically the same size at the rim as at the hub. The rear wheels spokes, however, were quite a different proposition. Bolts to secure the wheel to the sprocket-cum-brake drum had to pass through each spoke at a point approximately half way between the rim and the hub. This called for a much heavier section at this particular point, but above and below the resultant bulbous portion, the spokes were chamfered to reduce weight and to improve appearance.

Wire wheels may be a bug-bear but to produce a set of wooden wheels that look the part and will stand up to the normal buffeting and patter when fitted to a powered model is something of a problem.

(To be continued)

LOCOMOTIVE BALANCING

by D. H. Chaddock

THE article by Mr. Edgar T. Westbury on "Balancing Small Engines," published in the issues of THE MODEL ENGINEER dated March 13th, 27th and April 10th, 1952, has already provoked a certain amount of comment, and I should like to make it clear that my contribution to this discussion is intended to amplify and clear up one or two points which may be the subject of misunderstanding, particularly in respect of the section on locomotive balancing.

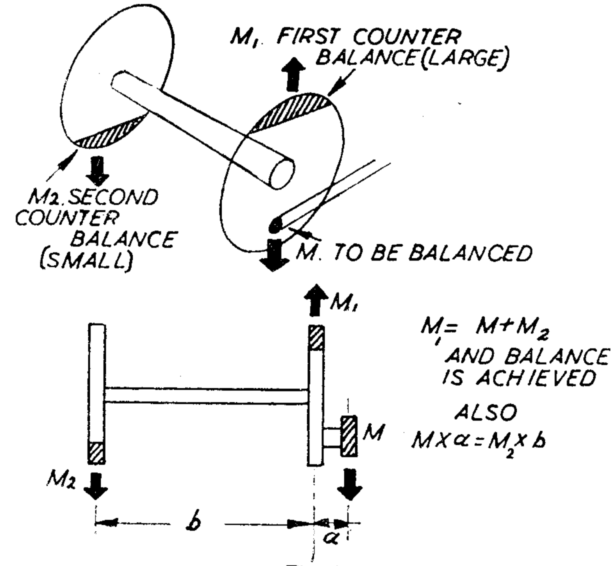


Fig. 1

The illustration on page 420 is undoubtedly an extraordinary arrangement, and presumably applies to a four-cylinder engine in which the inside crank is in opposite phase to the coupling-rod; otherwise, a most appalling state of unbalance would exist. The term "hammer blow" referred to in connection with locomotive balancing is not, strictly speaking, correct. In view of the fact that locomotives have axleboxes working in vertical horn blocks, it follows that up and down unbalanced forces can only be absorbed by contact with the rail, as the bearings and frame of the engine can have no part in absorbing them. The actual force is no more of a blow than the unbalanced forces in any other type of engine, but is, in fact, a sinusoidally varying force superimposed on the normal force due to weight exerted by the wheel on the rail; in other words, if the so-called "hammer blow" is plus or minus two tons, and the wheel load is ten tons, the rail load will vary from eight to twelve tons. As bridges have to carry the maximum load, and adhesion is governed by the lesser, it means in practice that the mechanical engineer loses four tons of the capacity which the civil engineer provides, which is not popular, to say the least of it. Actual balancing of locomotives can be quite simply worked out from the examples which have been given by Mr. Westbury in his articles, and is an interesting and instructive example of them.

Take, for instance, a coupled wheel; it is agreed that the coupling-rods are rotating weight and can be balanced as such. Taking one side first, if the rods were in the plane of the wheel, all would be well, but they are not, so remembering that there is another on the other side, we make use of it. Two small masses are therefore used to balance one larger mass as in the example quoted by Mr. Westbury, except that the one to be balanced is, in this case, overhung. (Fig. 1.) For the other side, exactly the same arrangement

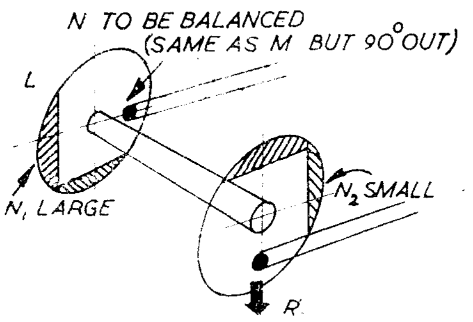


Fig. 2

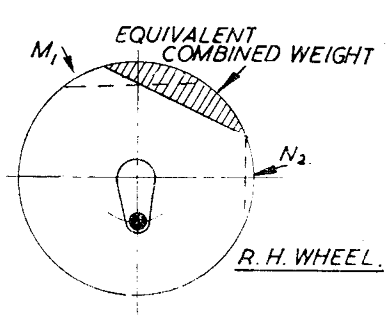


Fig. 3

applies, except that the cranks are at 90 deg. and if the left-hand cylinder leads, as is usual practice, we can put in a second set of weights as in Fig. 2. The weights *M* and *N* on each wheel can be properly located by working out the usual triangle of forces, and a single weight employed to perform each function as in Fig. 3. The secondary counter-balances are relatively small, and I have never seen couplied wheels in which the weights are not put dead opposite to the crankpins.* They may possibly, however, be cast in that way and the difference adjusted by the amount of internal lead filling. In any case, coupled wheels can be perfectly balanced statically and dynamically, and should exert no "hammer blow" on the rails.

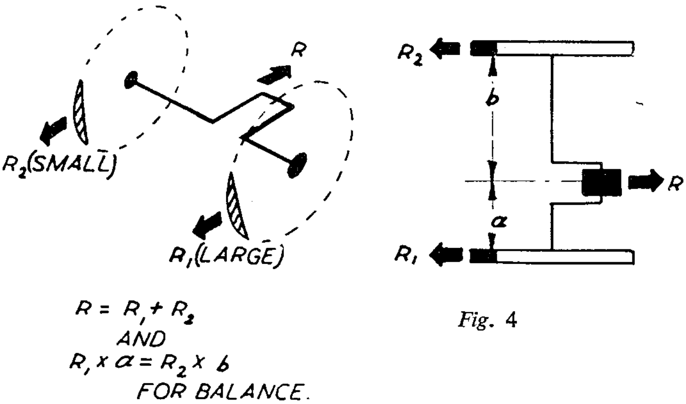


Fig. 4

Crank axles are more interesting, but still follow the same principles of balancing. The rotating weights are, of course, easily dealt with, but the reciprocating weights present more difficulty. If no attempt is made to compensate it, the reciprocating unbalanced force shakes the axleboxes backward and forward between the horn plates, and the engine pounds badly. If part of the reciprocating weight is balanced, up and down forces are introduced, just as one gets sideways thrust in a vertical single-cylinder engine, except that the locomotive man calls it "hammer blow." How much reciprocating weight is balanced out depends on the state of C.M.E.'s relations with the permanent way department; the more he takes off the horn cheeks, the more he puts on the track.

Balancing or partial balancing of an engine with 90 deg. cranks is no more difficult than balancing a single, if one considers each side separately, and then combines the results. For example, take a two-cylinder inside cylinder locomotive with coupled wheels, left-hand cylinder leading: for the right-hand side we can arrange to balance out the proportion of reciprocating masses which has been decided upon on both the right-hand and left-hand wheels as shown in Fig. 4. A similar arrangement is necessary for the left-hand inside cylinder shown in Fig. 5, and part of the balance-weight can be provided by the external coupling-rods by putting them opposite to the inner inside crank. By combining all these separate balance-weights in the rim of the locomotive wheel, the final location of the weight is as shown in Fig. 6.

If the right-hand crank leads, the balance-weight comes on the other side of the crankpin. It would be interesting to consider how many model engineers take this matter seriously into consideration when they buy a set of wheels for building a model locomotive, and it would be a nice point for judges at model exhibitions!

For outside cylinder engines, it is not generally practicable to put the cranks and coupling-rods in opposition, because it is nearly always desirable or necessary for them to work on the same pin. Therefore, balancing resolves itself into increasing the masses of the balance-weights on the driving wheel to compensate the agreed percentage of the reciprocating weight, in addition, of course, to the normal rotating weight as given in my first examples. Therefore, outside cylinder engines have the weights on all wheels opposite to the crank or coupling-rod pins, except that the weights on the driving axle are nearly always much larger than those on the coupling wheels, partly because of the increased rotating weights, partly to balance out a proportion of the recipro-

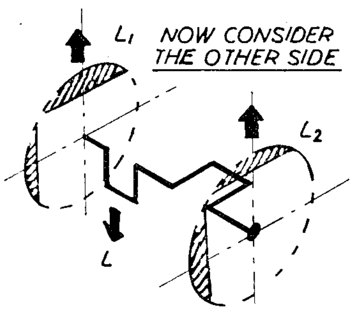


Fig. 5

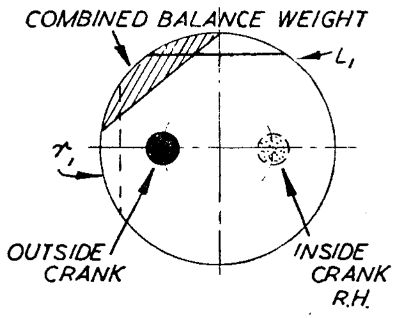


Fig. 6

*Since writing this, "L.B.S.C." has pointed out that the balance weights on the "Britannia" class coupled wheels are in fact displaced, but does not give the reason for it.

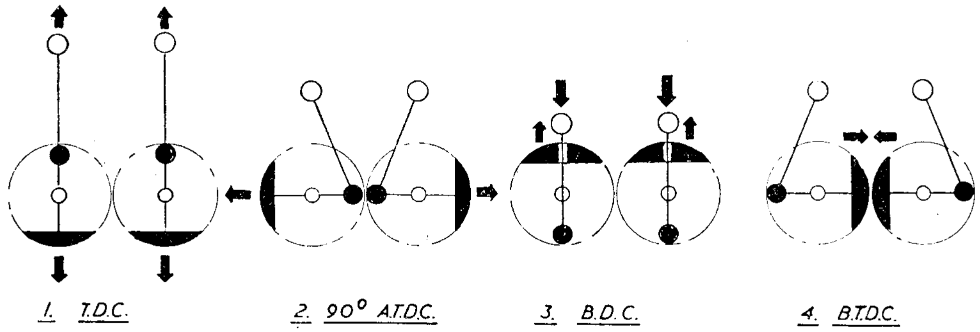


Fig. 7

cating weight on the nearest wheel, instead of carrying the unbalanced force through the bearings and the coupling-rod.

The rules for balancing three- and four-cylinder engines follow identical principles, and I deduce that the drawing in Mr. Westbury's article, which has been the bone of contention, if it is authentic, represents such an engine. Otherwise the enormous balance weight on the leading coupled axle could have no purpose other than to produce the most frightful " hammer blows " as well as pounding in the axleboxes.

While on the subject of engine balance, it may be remarked that Mr. R. E. Mitchell misses a point in the balancing of his split single engine (see page 504 of the April 17th issue) in which he says that about one-quarter of the reciprocating weight is balanced instead of the usual half. In a twin geared-crank engine, it is possible to balance the whole of the reciprocating weight without introducing a horizontal vibration, because the two balance-weights moving in opposite directions exactly balance each other. This theory was embodied in the Lanchester harmonic balance engine, and is the only type of simple engine in which one can achieve perfect primary balance. (Fig. 7.) I realise that in Mr. Mitchell's case, there may not have been room for sufficiently large balance-weights.

Although this principle can only be exploited in engines with contra-rotating crankshafts, it has been used very successfully in several well-known engines, including the Ariel Square Four and H type Napier aircraft engines. An experimental horizontally-opposed split-single engine was made some years ago by a well-known firm, having a slide crank and contra-rotating crankshafts, shown very diagrammatically in Fig. 8. This avoided all the errors due to angularity of connecting-rods, side thrusts, etc., and was

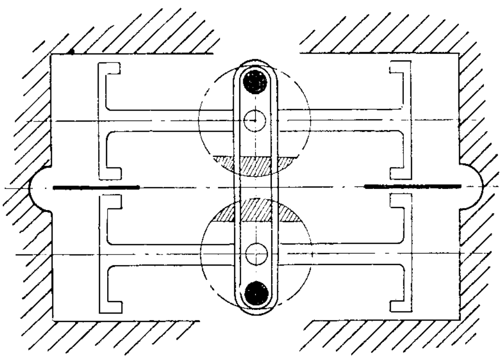


Fig. 8

a perfect example of balancing. It also avoids the eccentric loading of the usual slide or " Scotch " crank, and the engine is free from any unwanted forces liable to affect balance or mechanical efficiency. I never saw it run, and do not know what became of it, but it was certainly a very interesting conception.

For the Bookshelf

The Traction Engine, 1842-1936, by F. H. Gillford. (Published by the Oakwood Press, Tanglewood, South Godstone, Surrey.) Size $4\frac{3}{4}$ in. by $7\frac{1}{4}$ in. 36 pages, fully illustrated. Price 5s. 0d.

This is the latest addition to the " Locomotive Papers " series of handbooks begun by the publishers some years ago, and comprises a reprint of a series of articles published in *Engineering* in 1936. It is well printed and gives a concise history of the road locomotive and agricultural engine, illustrated by a remarkable selection of photographic reproductions, the originals of which have been provided by Mr. J. P. Mullett, with few exceptions. The opportunity has been taken to bring the text up to date and to add two appendices listing the principal British, American and Continental builders.

The story, if brief, is well told and extremely interesting. One or two misprints have been allowed to pass ; for example, we note that on the title-page the author's initials are incorrect, and on page 33 the name " Turford " should read " Tuxford."

*The Allchin "M.E." Traction Engine

to $1\frac{1}{2}$-in. Scale

by W. J. Hughes

IN the prototype, the crankshaft and second shaft are carried in split brasses, which fit into cast brackets which in turn are riveted to the hornplates. The brasses are retained in position by keeps, which have the usual syphon-type lubricators.

As seen in Photograph No. 10, the offside bearing for the second shaft is set in, the reason being that this brings the second motion pinion nearer in. In turn this reduces the overall width of the whole traction-engine, and that was a very important thing where rural lanes, narrow gateways, and the confined space of the average stackyard had to be negotiated.

The brackets themselves have spigots which fit tightly into slots cut in the hornplates, and flanges outside the hornplates through which the rivets pass. On the Allchin, separate brackets are used for each bearing, though on some makes of engine—Marshall, for example—both brackets were cast in one for the sake of rigidity and easier machining. In our model we shall use this method, for the same reasons!

Brackets for First and Second Shafts

One point about the model brackets is that although the blueprint specifies gunmetal for the castings, this is by no means vital, and in these difficult times you may get cast-iron, which is just as good.

Taking the right-hand (offside) brackets first, the best way to machine the spigots is to secure the casting to the vertical slide and end-mill them ut.

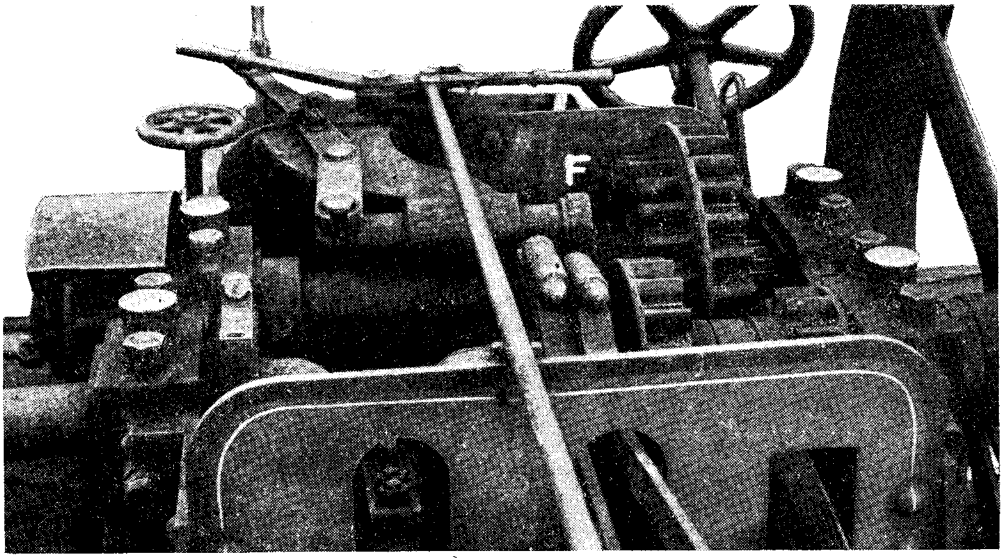


Photo by] [*Press Photo Agency, Sheffield*
Photograph No. 10. *Arrangement of crank and second shafts on the Allchin. Note left-hand bearings in line, but right-hand bearings out of line*

Photograph No. 11 shows how mine were done, with the casting gripped firmly in the jaws of a machine-vice bolted to the slide. This is quite a satisfactory set-up, provided you are willing to take light cuts; any heavy-handed work will distort the casting and result in inaccurate surfaces. As a matter of fact, though, you could manage without a vice, by passing a bolt through each gap, with packing under the second-shaft spigot to support it, and fastening down with nuts and washers. The latter would have to bear on the spigots, but not project beyond them.

Then, after milling the surfaces of the flanges and the edges of the spigots, the casting would be secured by clipping the flanges down. Having removed the nuts and washers, the spigot-faces would be milled down to give a depth of spigot of 3/32 in. and 7/32 in. respectively.

But undoubtedly the best way is to use a machine-vice as illustrated. You haven't one?

**Continued from page* 41, "*M.E.*," *July* 10, 1952.

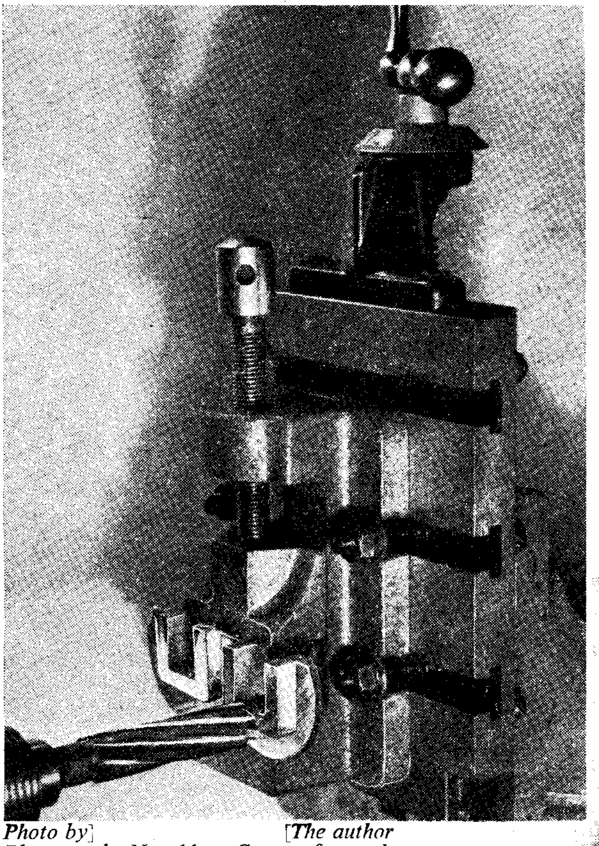


Photo by] [*The author*
Photograph No. 11. *Set-up for end-milling inner spigots of bearing-brackets*

Then I strongly—very strongly!—recommend you to acquire one! It can be one of the most useful accessories one can possess, and there have been instructions for making them in past issues of THE MODEL ENGINEER, if you can't afford to buy one.

Incidentally, it isn't necessary to use a "posh" milling-cutter like the one in the photograph; a home-made one such as "L.B.S.C." has often described will do the job quite as well. In fact, the only reason the taper-shanked one appears in the picture at all is because I bought, cheap, a number of "war-surplus" milling-cutters of various sizes some time ago, and very good value they have proved, too. Otherwise, being like many of my readers, a family man, with the attendant responsibilities, I couldn't have afforded 'em!

In the photograph, the finishing cut is being taken over the face of the second-shaft spigot. The flanges have been milled by traversing across and down, the edges of the spigots having been machined at the same time.

Use of the indexes on cross-slide and leadscrew handles saves trouble here, of course. For example, if the cross-slide screw is 10 t.p.i., fifteen revolutions gives the distance exactly to traverse between the front edges of the spigots, which is $1\frac{1}{2}$ in., of course.

The casting for the left-hand bracket is now machined in the same way, except that both spigots are only 3/32 in. deep; and then it is necessary to face the outer side of the outer spigots to give the correct overall thickness.

Photograph No. 12 shows a method of holding the casting to the slide, with two faceplate dogs and a toolmaker's clamp. The casting being operated upon is the left-hand one, of course—the right-hand one will need a bit of $\frac{1}{8}$ in. thick packing under the crankshaft inner spigot to support it.

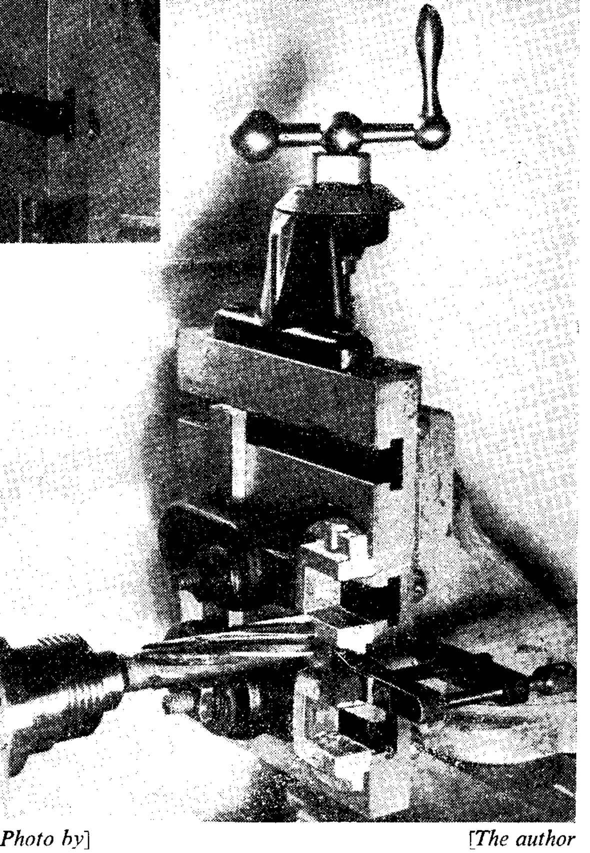
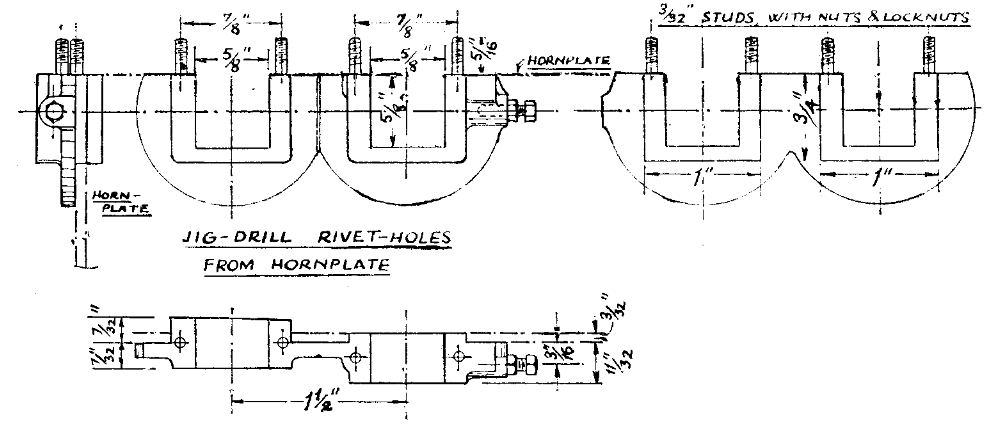


Photo by] [*The author*
Photograph No. 12. *Set-up for milling outer face of bearing-brackets to thickness*



Right-hand bearing brackets for the crank and second shafts. Note that the latter is offset

Having milled up all the surfaces, drill (No. 47) and tap a hole (7 B.A. or 3/32 in.) for each dummy adjusting screw, as shown in the drawings, and that finishes operations on these castings for the time being. The bearing-slots will be machined after the brackets are riveted to the hornplates.

Third-Shaft Bearing Brackets

The bearings for the third shaft and the hind axle possess round spigots which fit into corresponding holes in the hornplates, and flanges for attachment to them, but bolts are used instead of rivets. The purpose of the spigots is twofold, by the way; first to take the shearing stress off the bolts, and secondly to provide longer bearings.

On the third shaft, the left-hand bracket is quite a straight-forward affair, with a strengthening web below the inner spigot and an oil-box above. The right-hand bracket, however, has the pump platform cast integral with it, and in addition a slot has to be cut across the bolting face of the flange, for the reach-rod of the valve-gear to pass through. A separate oil-box has to be fitted for this bearing; otherwise it would be in the way of the pump, and the pump would be in the way of it!

Both these brackets—and the hind-axle brackets, too—fit on the inside of the hornplates, by the way, and so it is the outer spigot in each case which is machined.

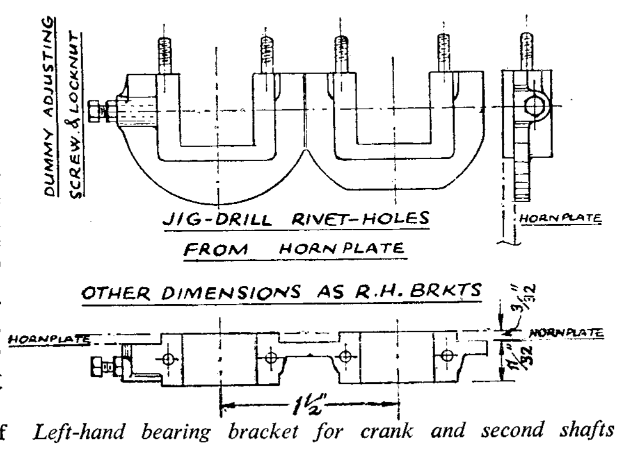
A Plug-Gauge

My favourite method of boring hole to a definite size is to make first a plug-gauge of the same size; this is especially useful in cases like the present, where two holes are to be bored to the same dimension. Having practised this method over a number of years, I now possess quite a number of gauges of various diameters up to 1½ in.; these will last a life-time, and are surprisingly useful.

All that is needed is to chuck a piece of rod—preferably mild-steel, but brass will do in a pinch—of diameter a little larger than the hole to be bored, and to turn the end down to the exact diameter required, for a length of ½ in. or so, using the mike. Then advance the tool one thou., by means of the cross-slide index, and take another cut over the first ⅛ in. of the gauge at that setting. Take the sharp corner off the outer end, and the gauge is ready for use. However, it saves time to punch the size on the end with number-stamps, and it saves storage space if the gauges are made double-ended, with say 9/16 in. diameter at one end and ⅝ in. at the other, and so on.

Left-hand Third Shaft Bearing

Machining the left-hand bracket is quite straight-forward, with the use of a four-jaw chuck. Grip the casting in the chuck by means of either the bolting-flange or the inner spigot, setting it so that the outer spigot runs true. Using a knife-tool, turn the spigot to ⅞ in. diameter by ⅛ in. deep, at the same time facing up the flange itself. Note that the spigot *must* be a good fit in the hole, and that, therefore, you should turn it to fit the hole rather than to a

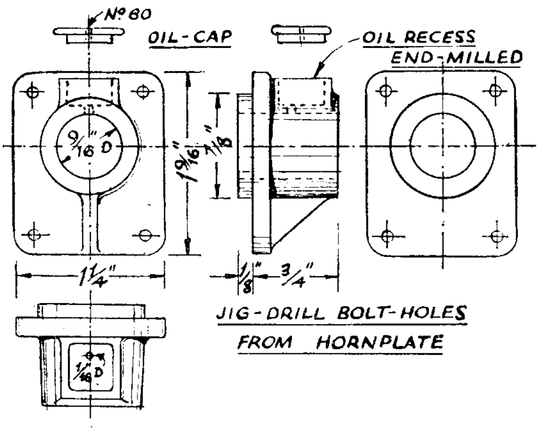


Left-hand bearing bracket for crank and second shafts

micrometer reading. Go very carefully when nearing size, because there isn't much length to try the fit on.

Now without moving the work in the chuck, bore the hole to $\frac{9}{16}$ in. diameter, using the plug gauge. When nearing the size, take only light cuts, partly to avoid a "bell-mouthed" hole, and partly so as not to make the hole too big. Bore out until the reduced end of the gauge will just go into the bore, and then take another cut *at the same setting*. This will probably remove the extra thou., and enable the gauge to enter. If not, take a half-thou cut, and try again.

If you have a $\frac{9}{16}$ in. reamer, use this to remove the last scrape. In any case, the plug should enter the hole without binding, but also without any shake, and should turn in it with the aid of a spot of oil.



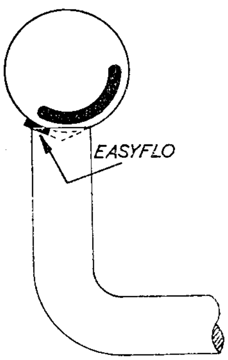
Left-hand bearing bracket for third shaft, with oil cap

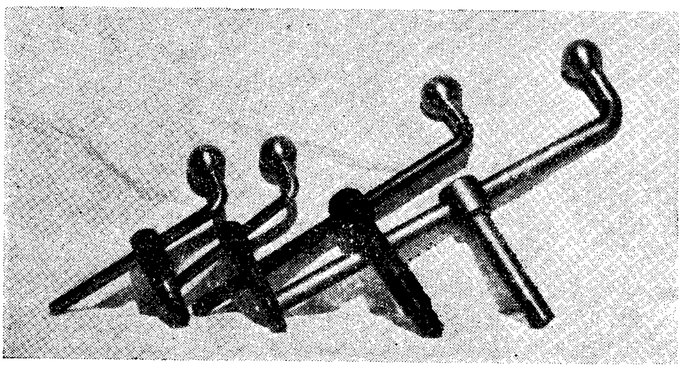
(*To be continued*)

CHUCK KEYS WITH KNOBS ON

by J. O. S. Miller (New Zealand)

THOSE who do a lot of lathe work will be quick to appreciate the improvements to the standard chuck keys, as shown in the photograph. Ordinary ball-bearings, preferably new ones, of a size in proportion to the chuck keys were used, and it took only fifteen minutes to alter each.





The operations were as follows :—

(1) Knock out the tommy bar, chuck in the lathe and face one end. Centre lightly and open out with a large drill to form a shallow dimple.

(2) Bend a short length of the bar, clean up and hold it in vice with dimple in vertical position.

(3) Fill dimple with Easyflo flux and water. Snip off approximately $\frac{3}{16}$ in. of Easyflo stick and lay it in one side of the dimple.

(4) Place clean ball on top and heat up from below with welding torch. Surplus flux will settle down as the Easyflo melts. When cleaned up, a nice fillet of Easyflo will show round the neck of the ball.

(5) Replace in chuck key securely.

A Rack and Pinion Feed Gear

for the Myford ML7 Lathe Tailstock

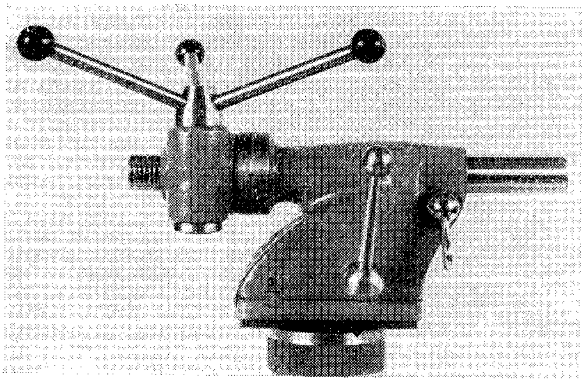


Fig. 1. The Cowell rack-feed tailstock attachment

WE have received from Messrs. E. W. Cowell, of 7A, Sydney Road, Watford, Herts, what appears to be a most useful fitting for the Myford M.L.7 lathe. This attachment consists of a tailstock barrel operated by means of a rack and pinion gear; the pinion is carried in a small bracket attached to the tailstock casting, and the rack is cut on the barrel itself. In fact, the arrangement is similar to the feed gear of a quill-type drilling machine.

Where the thrust within a lathe tailstock is taken on plain surfaces of large diameter, and the feedscrew is of coarse pitch, the friction set up, when feeding drills of even moderate diameter, may be sufficient to make feeding difficult, or even to lock the feed gear if the drilling pressure is further increased in an attempt to advance a large drill at the normal rate.

In these circumstances, the feeling is that one is trying to force a blunt drill into the work; but this impression is quickly dispelled when the same drill is transferred to the drilling machine, where the more efficient feed gear enables rapid and sensitive drilling to be carried out without difficulty.

In the same way, with the aid of the Cowell attachment, drilling in the lathe is much more easily done.

As the pitch diameter of the pinion fitted to the feed gear is rather less than 1 in. and the length of the hand levers is 5 in., the leverage obtained is approximately 10 to 1; a figure which compares favourably with the ordinary type of lever-feed tailstock, where this amount of leverage is, possibly, only obtained by fitting a hand lever of excessive length. Moreover, the attachment provides a length of feed of 4 in.

The accompanying photographs should help to make clear the constructional details of the device, and, at the outset, it may be stated that the workmanship is of a very high order, for the finish of all the components and the precise fitting of the working parts are above criticism.

The barrel appears to be finished by fine grinding to give smooth but shakeless working, and this applies, too, to the pinion shaft and its bracket. The barrel is bored $\frac{9}{16}$ in. right through, and the Morse taper at the forward end has a high surface finish. The pinion bracket, seen

(*Continued on page* 185)

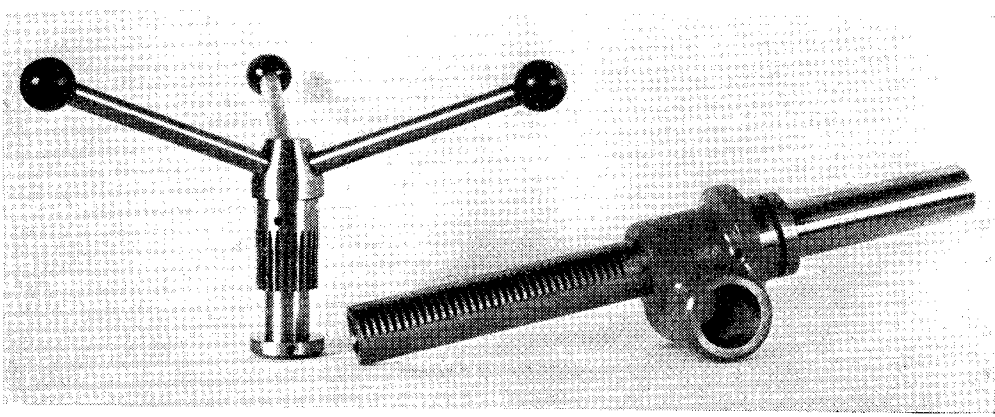
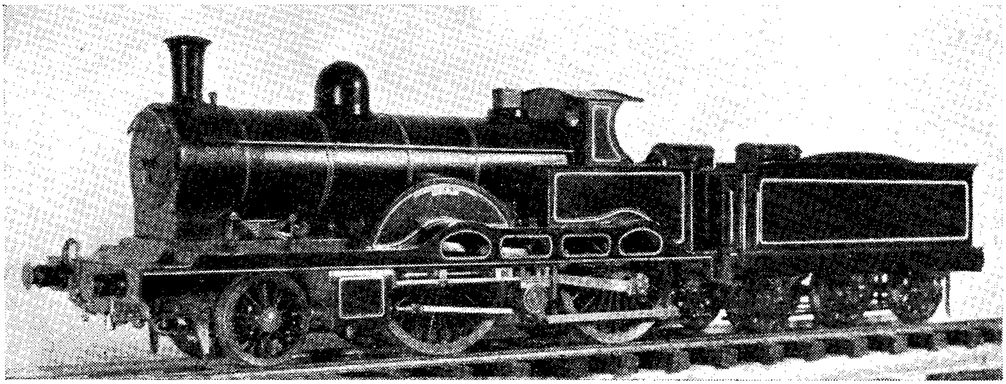


Fig. 2. Showing the barrel and its pinion feed-gear

"L.B.S.C.'s" Lobby Chat

Another Webb Compound

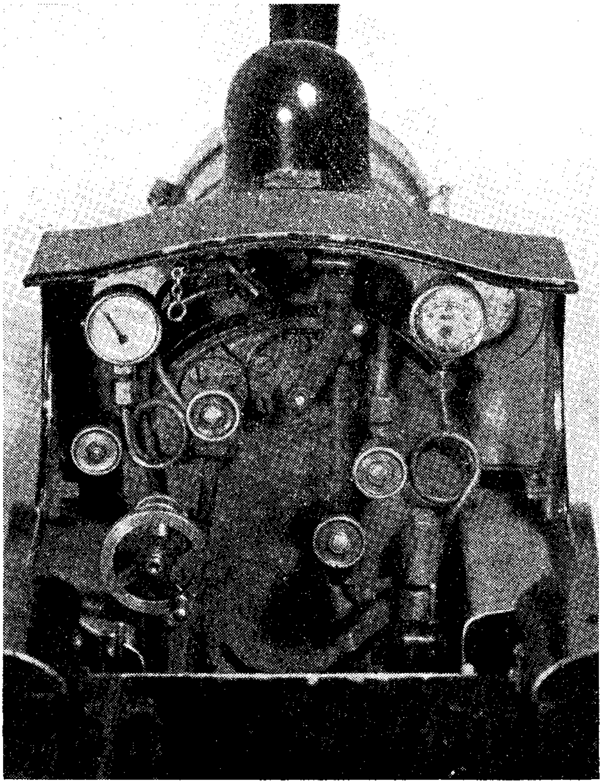
SEVERAL new readers, referring to my occasional references to my 3½-in. gauge Webb compound engine *Jeanie Deans*, have asked if this engine has ever been fully described in these notes, and whether blueprints of her are obtainable. I have never given any detailed instructions for building an engine of this type, one reason being that in my own edition, there are several items that I prefer not to disclose for the time being; I just love to keep the ace of trumps up my sleeve, for production if anybody should "get saucy," in a manner of speaking. Older readers will chuckle at certain things of this kind that have happened in the past! However, some years ago, I gave Mr. Roy Donaldson permission to take some particulars from the actual locomotive, and make blueprints of her as he is one of my few personal friends. This was done; and copies of the prints he made, are now obtainable from our offices in Great Queen Street, and can also be purchased from the advertisers supplying castings and material for locomotives which are described in these notes. Whilst these prints do not show all detail exactly the same as on the original engine, a very satisfactory little Webb compound can be built by their aid; and the accompanying photo-reproduction shows one that has been built by Mr. R. H. Procter, of the Tonbridge M.E.S.



Mr. R. H. Procter's 3½-in. gauge Webb compound "Ionic"

Friend Procter—who, incidentally, is now hon. secretary of the club—is one of a group of three members who occasionally bring their engines for a run on my road. The other two are Harry Mills and Charles Langer, and all are highly amused at my bestowing on them the nickname of the "Three Musketeers of Kent." When they saw the original *Jeanie Deans* run for the first time, the first-mentioned immediately fell in love with her; and as he had just finished a *P. V. Baker* tank engine, and was looking for another type on which to exercise his talents, he decided to have a shot at a similar engine. Having a spare set of cylinder castings, I promptly made him a present of them—good intentions should always be encouraged!—and told him where to get blueprints. He immediately got busy; and the reward, the hope of which sweetened his labours, can be seen in the pictures, and certainly deserves high commendation. She bears the name *Ionic*, No. 1306 of the full-sized batch, as a reminder of a picture-postcard of our friend's childhood days; 1306 made the first non-stop run between Euston and Carlisle in September, 1895, and I well remember the fuss the daily press made about it. One reporter, whose enthusiasm exceeded his knowledge, affirmed that it would only be a matter of weeks before the "mail" (they always called the most important train the "mail") ran non-stop from Euston to Aberdeen in less minutes than miles. They haven't done it yet!

The little *Ionic* is a worthy sister to my own *Jeanie Deans*, and has put up some grand performances on the club tracks at Maidstone and Tonbridge, also has shown her paces on my own road and elsewhere. She differs from my engine in certain details, such as the chimney, which is London, Chatham & Dover style, and the smokebox; mine is on a saddle. Certain of the motion details are different, also the tender, which has a horseshoe-shaped coal space, and elevated tool boxes. She has also a crosshead pump. If you compare the illustrations with the picture of my engine in the *Live Steam Book* and on the dust cover, you'll see that they are sisters, but not twins.

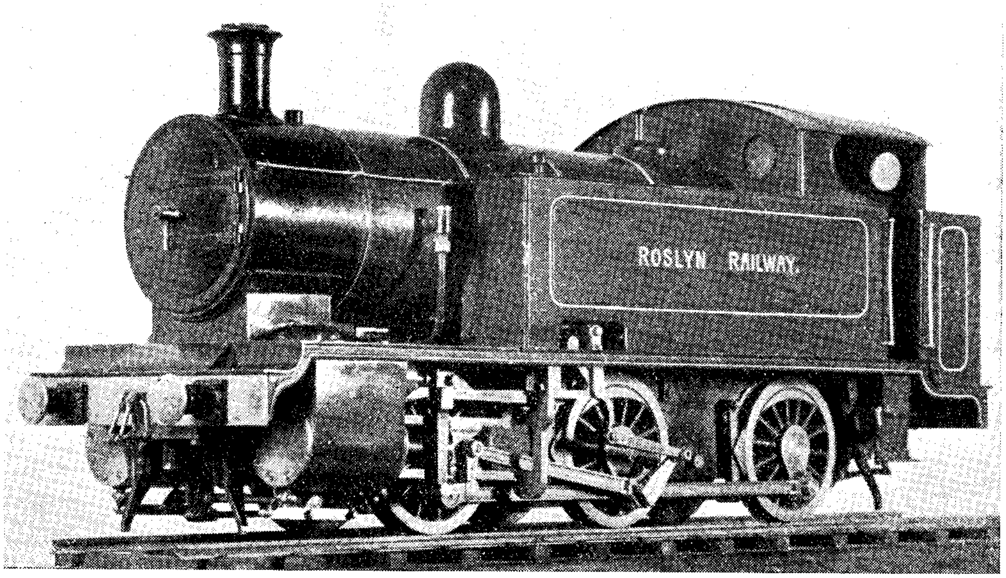


Footplate of the compound

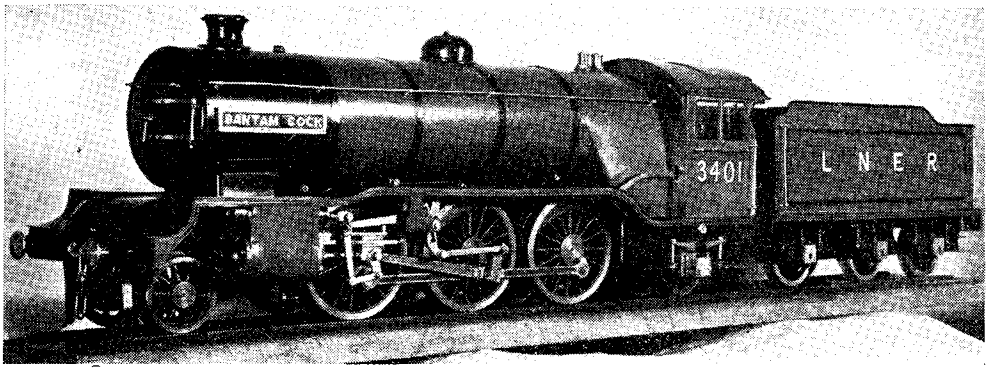
Stable Companions

Mr. Procter's *P. V. Baker* type 0-6-0 tank engine is also illustrated. No description is needed, as she is built according to "Live Steam" practice, but she differs from the original design in having slide-valves instead of piston-valves. With an engine fitted with Baker valve gear, no alteration of the actual valve-gear is needed, as it is suitable for valves with either inside or outside admission; for outside admission slide valves, it is only necessary to reverse the connections at the top of the combination lever, connecting the upper pin to the valve spindle fork, and setting the return crankpin to lead the main crankpin, as shown in the illustration. This locomotive has also done some excellent running, and has visited my own line on several occasions, always performing well.

A "panorama" view of the Tonbridge club track is also shown. This is situated in the Lower Castle playing field, and is laid for $2\frac{1}{2}$-in., $3\frac{1}{2}$-in. and 5-in. gauges. The construction is shown in the photograph, and needs no detailed description. The apparent kink in the foreground isn't in the actual line; only in the picture. It was caused by joining two separate photographs, in order to show the entire layout. The line is quite safe for fast running. In passing, it is strange to look back and recall that not so very many years have passed since the first "officially author-



Mr. Procter's "Slide-valve Baker"



Mr. E. H. Whalley's $3\frac{1}{2}$*-in. gauge* " *V4* "

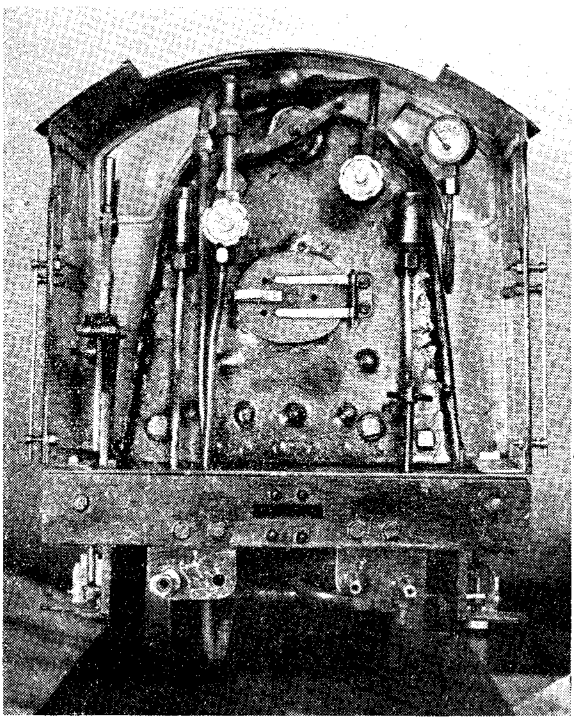
ised " line was erected. I can recall a certain Sunday morning in the late 'twenties when the old S.M.E.E. portable line was temporarily erected in Victoria Park, in the East End of London, and recollect the expressions on the faces of sundry spectators when, for the first time, they saw tiny steam locomotives burning coal and hauling living loads. I heard a typical Cockney exclaim " Blimey—yer can't call *them* toys ! "

" Shall Us—Let's ! "

If anybody who reads these notes has developed a yen to build a little locomotive, but is deterred by the fact that he knows nothing at all about locomotives, and has had no experience in using tools, he will promptly be reassured on reading the story of how a Warrington reader, Mr. E. H. Whalley, " took the plunge " in similar circumstances. Not only that, but carried the job right through to a successful conclusion ; not only building the engine, but learning a great deal in the bargain. Despite a lack of knowing " how it works," Mr. Whalley had been interested in locomotives from early childhood, haunting railway lines as did young Curly, and walking from one station to the next, so that he could buy a halfpenny half-single ticket, and ride back on the train. He also did a bit of London " window-shopping," visiting Bateman's, Lee's, Lucas and Davies, and Stevens's Model Dockyard, admiring the various caricatures in polished brass that were displayed in those days. When he grew older, he began to take an interest in woodworking, practised it, and achieved a considerable amount of skill ; but the love of locomotives was only lying dormant, and flared up again when in 1947 he started to read my notes in this journal. Although he didn't know the first thing about locomotive mechanism, and had no experience in using the " tools of the trade," he was sorely tempted to " have a go," relying entirely on my instructions. When a friend offered to let him have the complete " words and music " for building my $3\frac{1}{2}$-in. gauge *Bantam Cock*, a L.N.E.R. 2-6-2 described in a contemporary journal, it was a case of " unconditional surrender " —at the age of 64 !

Some Lathe !

Our worthy friend says that the sight of the lathe, on which all the turning for the locomotive was done, would send most folk into hysterics. It is a home-made affair with two bright mild-steel bars for a bed. The headstock consists of two



Footplate of the " *Cock* "

$1\frac{1}{2}$-in. plummer-blocks mounted on pieces of 2-in. × $1\frac{3}{8}$-in. channel iron. The tailstock is built up from pieces of steel plate, and was welded by a friend. The mandrel is hollow, being bored out in position by aid of a long $\frac{13}{16}$-in. drill borrowed for the occasion ; that alone was a hefty job. The compound swivelling slide-rest was made partly from scrap, and partly from castings made to Mr. Whalley's own patterns. There is no back gear, but a leadscrew is provided, and this was originally the screw of a car jack, of the type which lifts a car by the bumper, a hook being provided on the nut, to go under the bumper. This hook is attached to the cross-slide of the lathe. The mandrel pulley is a wooden one with four flat steps ; and the machine, which Mr. Whalley calls "Heath Robinson," doesn't boast of a self-centring chuck. Speaking of Heath Robinson, most of his gadgets, though held together by pieces of knotted string, could be made to work (though it would have taken many little balloons and much pushing from underneath, to hoist the Saltash Bridge into position !) and the lathe works, inasmuch as all the turning and boring, for the engine and tender, were done on it.

The Engine

There is no need to describe the locomotive in detail, as she is built in accordance with the drawings and instructions, except for small variations as mentioned below. As our friend says he will never own a continuous track, and that all the running will be done on a straight line, a "pole" lever was substituted for the wheel-and-screw reverser called for in the specification. The pin for keeping the firebars in position, is put through the trailing frame ; the knob can be seen above the trailing spring, in the photograph. The boiler joints were riveted ; but to make assurance doubly sure, a friend Sifbronzed them as well. To make the gauge glass get-at-able for cleaning, and easy renewal in case of breakage, a $\frac{1}{2}$-in. hole is drilled in the cab roof immediately above the top fitting, and a flush cover made to fit. This is attached to a bit of spring steel riveted to the underside of the cab roof, so that it can be pressed down and pushed aside, leaving the hole clear for applying a box-spanner to the gauge plug. Old George Kennion supplied castings for the engine wheels, but the tender wheels were turned from solid cast iron ; some job that, considering the lathe that was available.

Other details include stainless steel hinges and handles on the smokebox door, and hinges and catch for the firehole door ; and friend Whalley says never again, it costs too much for drills ! Incidentally, just for the sake of curiosity, as I happened to have a small piece of 20-gauge stainless steel sheet, I flanged up a shovel blade from it, and Sifbronzed a handle to the blade, made from 5/32-in. rustless steel rod. The gadget was presented to *Jeanie Deans* ; so if the enginemen want to cook any eggs and bacon, or fry a steak (the thought of it makes my mouth water !) they won't have to worry about scouring up the shovel !

The nameplates are home-made, too. All the letters, and the rectangular edging, were cut out by hand, and sweated to a baseplate, giving raised brass letters on a painted ground ; the plates are fixed to the smokebox by studs and nuts. The painting, lining, and numbers and letters, are Mr. Whalley's own handiwork ; the colour is green, with black lining. The inside of the cab is grey ; in the picture, it appears somewhat rough, but this is the effect of strong artificial lighting. In reality, the finish is quite smooth. When the photographs were taken, she still needed tender axlebox lids, and rear buffers, but is now complete. As to her working capabilities, our friend only has one car, which will carry four adults, and she pulls this as though it were a bag of feathers ; on a recent Saturday, it came on to rain, but the engine took no notice at all, and carried on.

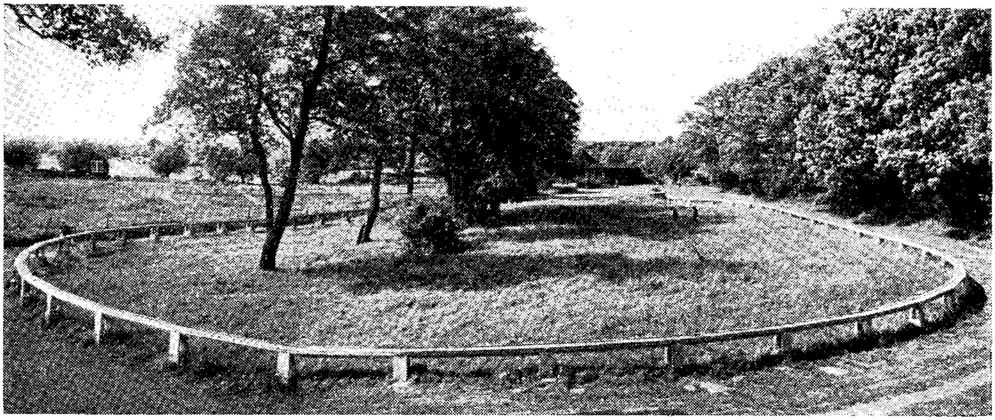
Experience Still Teaches !

Mr. Whalley says that one of the extraordinary things about the whole business, is the amount of knowledge he has gained from the instructions I gave for building the locomotive. Whereas before, he knew little or nothing of a railway engine's personal anatomy, he is now quite "at home" when anybody starts talking about expansion links, combination levers, and all the rest of the blobs and gadgets. Also he has acquired a fair amount of skill in the use of engineering tools, and found my described methods came up to expectations. For instance, the cylinders were neither reamed nor lapped, but finished as I suggest, by running the tool through two or three times without altering the setting of the cross-slide. The pistons were carefully fitted as per notes, and the result is seen in the efficiency of the engine on the road. Our friend confesses to funking the job of making an injector—anybody with a lathe like *that*, has the best of excuses !—but says he may have a go, later on ; and concluded his description of the job with a very kind appreciation of my notes, which I gratefully acknowledge. It makes the job of writing them really worth while.

Another Injector Tip

Mention above of injectors, reminds me of a letter recently received, concerning some injector trouble. The writer says that when he made the gadget last January, it worked perfectly first time, but now it dribbles a little at the overflow. He has cleaned it, but no improvement, so what ? That trouble is soon shot. As I am writing this, the sun is shining brilliantly, and the thermometer is very nearly at blowing-off point. If I took one of the engines out now, and filled up the tender from my lineside tank, I doubt if the injector would work at all, for the simple reason that the water would be too hot to fully condense the steam. The querist uses rainwater, collected in a butt, as the mains water in his district is hard ; and in summer time, if the summer is anything like it should be, the temperature of the water in the butt, is far above what it was in winter. If he wants the injector to work as it did in January, he will have to cool off the feed water to something near the January temperature. As our mains water is very cold, I take a canful out, to fill my engines' tenders, when Old Sol pulls the funny stuff on my lineside tank ; and this saves any overflow dribble.

Care should be taken when operating injectors



The Tonbridge club track

in hot weather, as any full-size driver or fireman will confirm, especially as little injectors are far more sensitive than big ones. If steam blows back for a few seconds, in a 4,000-gallon tender, it hasn't much effect on the temperature of the water ; but a similar blow in a three-pint tender, will make the contents tepid. I had a demonstration of this, only the other evening, time of writing. I steamed up an engine for a couple of friends whom I hadn't seen in what the kiddies call "donkey's years," and when giving it a preliminary run, the injector worked perfectly with a dry overflow, running or standing. When one of my friends had a go, he fumbled the injector operation a little when running, and let steam blow back into the tank. It was a warm evening, and we were using water from the lineside tank, which was almost too warm for injector working ; consequently, the injector, although putting into the boiler all the feedwater required, lost a few drops at the overflow. There was nothing the matter with it ; it was merely that the steam couldn't fully condense in the feedwater, plenty warm to start with, and further aggravated by the steam-heated engine tank. I ran the same engine next evening, with nary a dribble, using water from the kitchen tap. Incidentally, I am experimenting with a double steam cone, which will enable a wee injector to feed really hot water ; but of that, more anon.

If you get an air or steam lock in the feed pipe, turn on the water full, and open the steam valve just a little, which will suck out the air or steam and allow the water to come through. This is full-size practice. If you open the steam valve too much, you'll only aggravate the trouble, as the steam will take the line of least resistance. Provision was made in the old Giffard injectors, for gradual steam admission, by a long tapered valve in the steam cone.

A Rack and Pinion Feed Gear

(*Continued from page* 180)

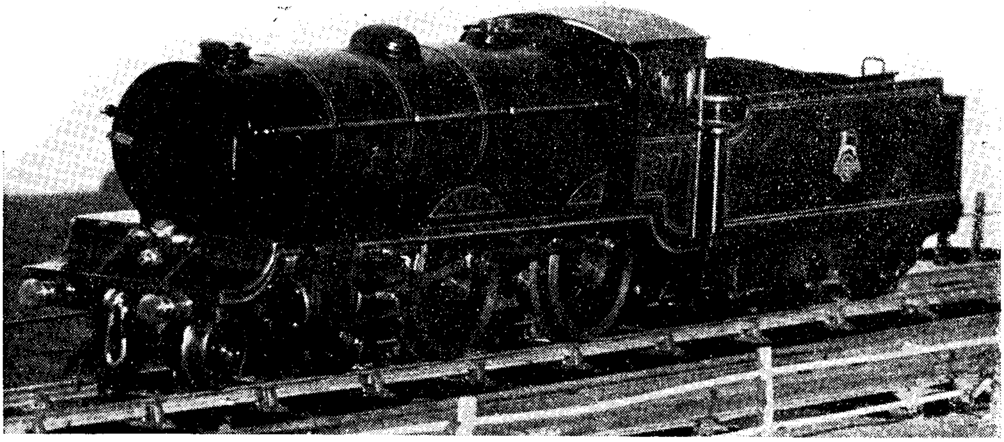
in the photograph of the parts, fits into the rear end of the tailstock casting, where it is secured in place by the standard form of latch-plate, fitting closely in a groove machined in the bracket spigot. This bracket provides the housing and two bearings for the pinion shaft. Lubrication has not been forgotten, for a lubricator fitted to the top of the shaft feeds oil to the pinion and its bearings. The pinion assembly is retained in place in the bracket by means of a collar clamped to the lower end of the shaft with an Allen grub-screw.

The three hand levers are screwed into the cap of the pinion shaft and are set in a convenient working position.

Little need be said of the working of the attachment, as it was found that drilling could be carried out with the same ease as in the drilling machine ; provided, of course, that properly sharpened drills were employed and that the work was rotated at the right drilling speed. Graduations on the barrel would enable the depth of drilling to be determined and, no doubt, the manufacturers will consider fitting an adjustable clamp-collar to the barrel to act as a depth stop when machining a batch of components.

For turning work between centres, the barrel can be secured quite firmly by means of the standard barrel clamp-screw.

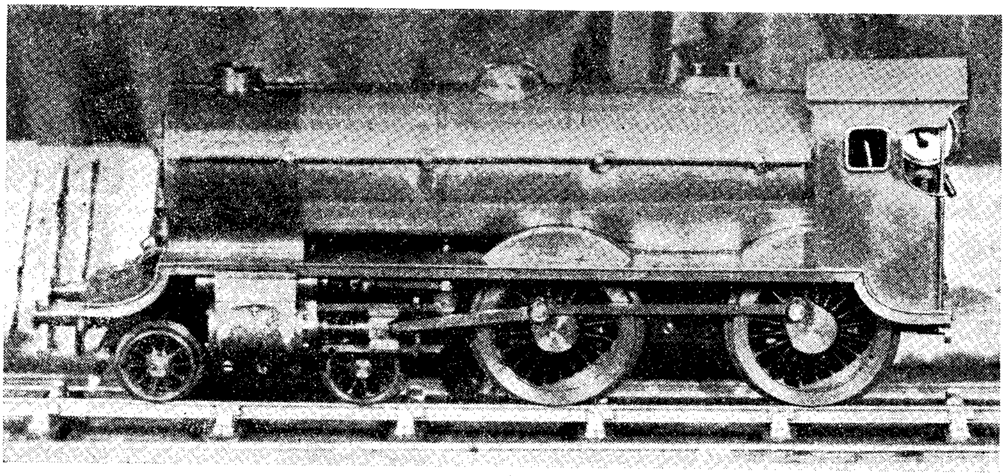
A SUCCESSFUL "FIRST ATTEMPT"



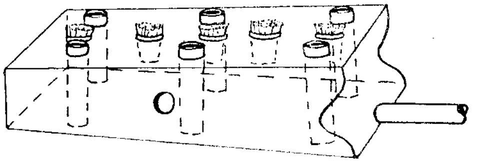
THE two photographs reproduced herewith show a "O"-gauge "Bat" built by Mr. W. Dickson, of West Hartlepool, who obtained the blueprints and some of the back numbers of THE MODEL ENGINEER from us. He states this little engine is his first attempt at small locomotive building, and that the construction was begun about twelve months ago.

The loco-type boiler was chosen because it was nearest to the real thing, but Mr. Dickson did not then realise what the firing of it would involve. When the engine and the hand pump had been finished, but before the building of the tender had been started, the notes on firing *Tich* were published, and they set Mr. Dickson to spending many hours with an auxiliary jet, trying to keep a fire going in the firebox. He did not achieve much success ; the first raising of steam with a charcoal fire was easy, but as soon as anthracite was fed in the fire just died out !

After that, spirit firing was given a trial and a burner was made which proved very satisfactory ; it is illustrated in the sketch reproduced. It is exactly the shape of the ashpan with the back end closed, and it is held in position by the same retaining pin, against the bottom of the firebox. Six air-pipes are fitted into the bottom



Mr. Dickson's "O" gauge "Bat" before being painted

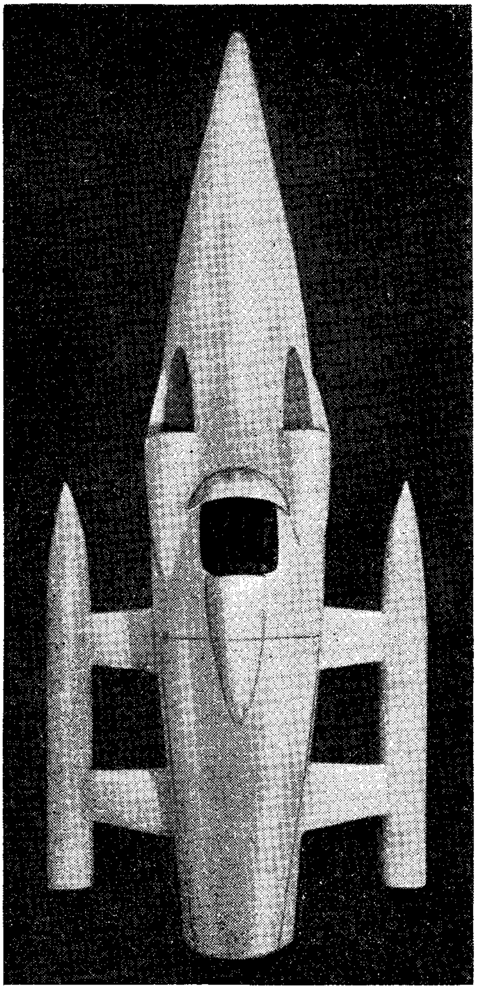


Sketch showing Mr. Dickson's spirit burner

and pass up through the tank, their upper ends being level with the tops of the wicks; they seem to be sufficient to prevent excessive drawing away of the flames by the blast.

After settling that problem, the tender was built with a spirit tank and sump, since when the little engine has done much running; on the occasion when the second photograph was taken, she had had steam up for three hours consecutively.

A NEW WATER SPEED ATTEMPT



A STRIKING sidelight on the recent discussion on model speed boat hull design is thrown by the recently released photographs of the model of Mr. John Cobb's new Railton-Vosper boat, with which he proposes to challenge the existing water speed record. It has been decided, in view of the problems of attaining reasonableefficiency with a propeller at high speed, to use a jet engine for propulsion, and this has had considerable influence on the general design of the hull. This is not an entirely new departure, as the late Sir Malcolm Campbell tried out a jet engine in his famous *Blue Bird* a few years ago, but his experiments in this direction were never brought to a successful conclusion. The engine to be used is the well-knowm de Havilland Ghost, as fitted to the Comet air liner, and also the Vampire fighter which still holds the world's altitude record. A considerable amount of research has been carried out on the hull design, to obtain aerodynamical efficiency and avoid forces tending to lift or depress the hull at high speed. Trials have been made with rocket-propelled models, the first ones being of one-sixteenth scale, and larger-sized models followed, up to one-sixth scale; the latter has been timed at an actual speed of 97 m.p.h. The hull is built from birch plywood and aluminium alloy, the latter being used for structural members and planing surfaces. It is expected that the first trials of the full-sized boat will take place on Lake Windermere towards the end of August.

We hope to be able to inform our readers of the results of these trials in a later issue.

The Lost Wax Process

for making castings to close tolerances

by " Foundryman "

MANY potential model engineers often find it difficult to obtain the castings they desire for the models they wish to construct. True, castings can be obtained from a number of sources for standard models at a reasonable price, but it is when one wishes to construct a model of some engine or machine which is not covered by those catering for model makers that a sense of frustration arises.

To obtain such castings from local foundries usually entail considerable expense, as often they do not wish their general run of work interrupted by giving attention to these occasional jobs, which invariably are not a paying proposition.

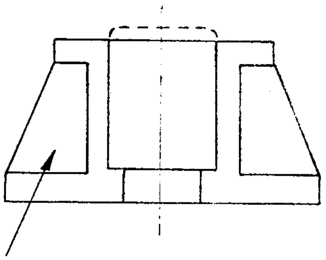


Fig. 1

For some of the simpler types of castings the model maker can easily produce his own patterns in wood and mould them in a suitable sand, casting them with an alloy of lower melting point than iron or the brasses. Various alloys of aluminium are very suitable for this purpose and as such find favour with model makers.

" Ciri-Perdu '

One of the chief advances in foundry technology during the last decade has been the introduction of " ciri-perdu " or the lost wax process for the manufacture of castings required to close tolerances and not machined, a process used extensively for the manufacture of art castings.

Although the technology is somewhat involved so as to ensure quantities of castings being produced exactly alike, a modified practice can well be adopted by the model engineer to produce the castings which by orthodox methods would be rather difficult.

Fig. 1 illustrates such a case, it being a cylinder cover and stuffing-box for a steam engine. A pattern for this in wood, would have to be so jointed as to allow for three part moulding, or, alternatively, the exterior would have to be formed in a core, both methods being rather ambitious for the model maker to attempt.

It is possible, however, to obtain some wax from which a pattern can be constructed by first forming from this material the various sections forming the pattern as Fig. 2. These can then be fastened together in correct position and held there by fusing each to the other by means of a hot wire.

This pattern can now be moulded in two boxes, suitable runner and riser outlets being provided. Warming the mould melts the wax which can be drained out through the before-mentioned holes. Incidentally, the wax makes a nice surface on the face of the mould which is imparted to the resultant casting. The two boxes are next parted in the usual way and a core for the centre inserted in a suitable core print as dotted lines Fig. 1 and *A*, Fig. 2.

Complicated Castings

This method of pattern-making, although unorthodox does enable a model maker to produce those more complicated castings he requires far more easily than by using patterns of wood and adopting three-part moulding. The only disadvantage is that each pattern will only produce one casting as it is destroyed on heating the mould to remove it.

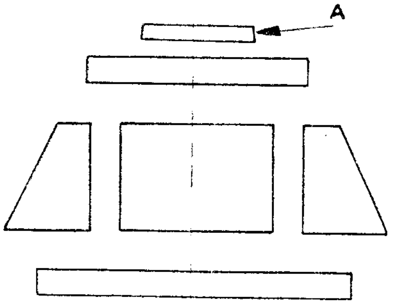


Fig. 2

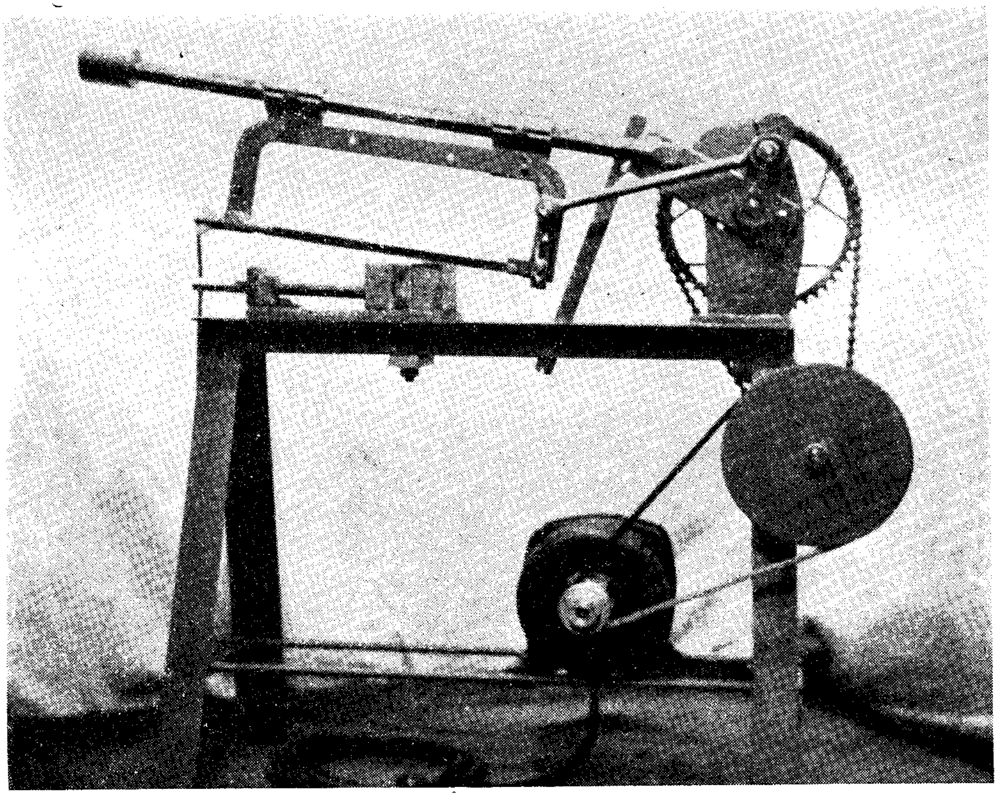
Should two or more castings be required, however, the moulds used to form the various components of the original can always be used to produce another set. These moulds can be either of wood, clay or other suitable medium as will suggest itself to the keen experimenter in casting production by this modification of the ciri perdu process.

A SELF-CONTAINED POWER HACKSAW

by Cedric Maude

THIS machine had to be portable and self-contained, as, like many other enthusiasts, the little room I have is very valuable, bench room in particular. This is my solution to the problem:

The bed is of angle and trestle form, the two top angle rails of $1\frac{1}{2}$ in. $\times$ $1\frac{1}{2}$ in. $\times$ $\frac{3}{16}$ in. each 24 in. long are separated by three tubular distance-pieces of 3 in. $\times$ $\frac{3}{4}$ in., set one at each end and one at $7\frac{1}{2}$ in. from the other at the drive end. The bolts are 4 in. $\times$ $\frac{7}{16}$ in. Whitworth, and the two end bolts also hold the legs to the two horizontal rails which, when bolted together, form the bed.



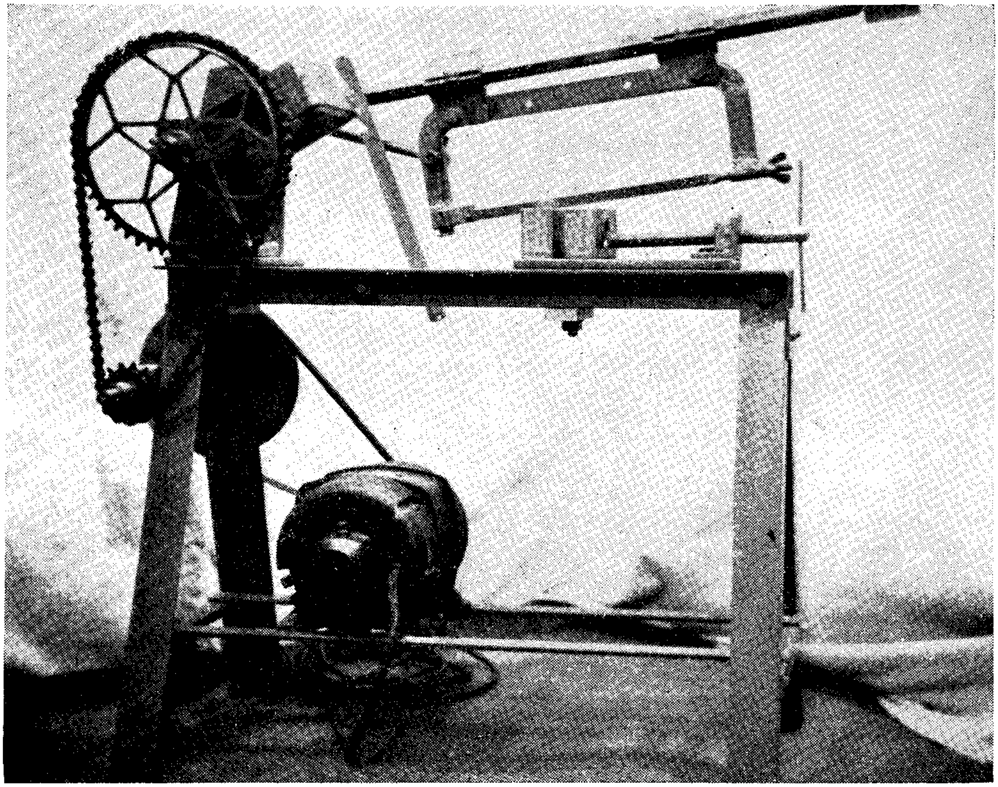
The legs are of $1\frac{3}{4}$ in. $\times$ $1\frac{3}{4}$ in. $\times$ $\frac{1}{8}$ in. angle-iron each 20 in. long (these came from an old iron bedstead, I believe) each leg being cut away at the bottom on the end side of the angle, to allow them to stand more firmly on the floor. The legs are now bent to form an "A" section, being 13 in. apart at the bottom of the legs at each end. There is also a cross member of 1 in. $\times$ 1 in. $\times$ $\frac{1}{8}$ in. angle at each end, from leg to leg, at 5 in. to the centre from the bottom of each leg. Two cross rails of 1 in. $\times$ $\frac{1}{4}$ in. $\times$ $24\frac{1}{4}$ in. long run from end to end and are bolted at the ends to each cross member. These can be set the best distance apart to suit the motor. At the top of each leg on the end face a piece of metal $1\frac{1}{2}$ in. $\times$ $1\frac{3}{4}$ in. was removed. This was to allow for the bending of the leg and a metal plate 2 in. $\times$ $\frac{1}{8}$ in. $\times$ $3\frac{1}{2}$ in. long was placed across the end, a distance of $2\frac{1}{2}$ in. to the centre of the fixing bolts from the top of each leg to improve rigidity and appearance.

The head is mounted at the extreme end of the bed and is of cast-iron, but I see no reason why a fabricated one could not be used. The head is $4\frac{3}{4}$ in. from its base to the centre of the crankshaft. It is 4 in. through the bore and bored to take a $\frac{3}{4}$ in. diameter shaft. The method of fixing to bed is by two clamping-bolts and plate.

The slide bar is of $\frac{3}{4}$ in. $\times$ $\frac{3}{4}$ in. $\times$ 24 in. bright drawn mild-steel, welded to one side of a U-shaped piece of black mild-steel 2 in. $\times$ $\frac{1}{2}$ in. $\times$ 17 in. and bent to form a square. A U-shape $6\frac{1}{2}$ in. $\times$ 4 in. $\times$ $6\frac{1}{2}$ in. is bored and reamed $\frac{3}{4}$ in.

at a point 1½ in. from each end, and is pivoted on the crankshaft, which is of bright rolled mild-steel ¾ in. diameter × 8 in. long. This is turned down to ⅝ in. diameter for a distance of approximately 1⅛ in. which is for the cycle gear wheel and is attached by a tapered cotter, as in usual cycle practice. The crank is of cast-iron, giving a stroke at the saw up to approximately 6½ in.; this crank is bored ¾ in. and fixed to the shaft by means of a set-screw.

the blade takes a central position. The tension on the saw is applied by a wing-nut ⅜ in. diameter Whitworth set-screw (square head) of which a saw cut has been made centrally through the head to the screwed portion to a depth of approximately ½ in. The head is drilled at right-angles to the saw cut and a pin is inserted through both head and blade hole. The screw passes through a piece of tube which has been welded or brazed to the front leg of the frame and shortened the



correct amount to allow for the tube and to keep the saw parallel with the frame.

The connecting-rod is 9 in. centres, and is formed by welding or brazing two collars or bosses on to a length of ½ in. diameter mild-steel rod, the big-end of which is of 1⅜ in. diameter by ⅞ in., bored and reamed ¾ in. The other, for small-end, is of 1 in. diameter × ¾ in., and is bored and reamed ⅝ in. Bushes were made and fitted to the crank and saw frame by a ⅜ in. bolt and $\frac{5}{16}$ in. set-screw respectively. A small weight may be added at the end of slide bar to add to the cutting efficiency as desired; in my case it is a piece of bright rolled mild-steel about 1¾ in. diameter × 2½ in. An adjustable saw rest was made, which consists of a piece of black mild-steel ¾ in. × ⅛ in. pivoted on the inside of the bed at the lower end by a ¼ in. set-screw, spring washer and lock-nut. The upper end has three catch positions which engage under the 2 in. × ½ in. black mild-steel U-piece, as shown in the

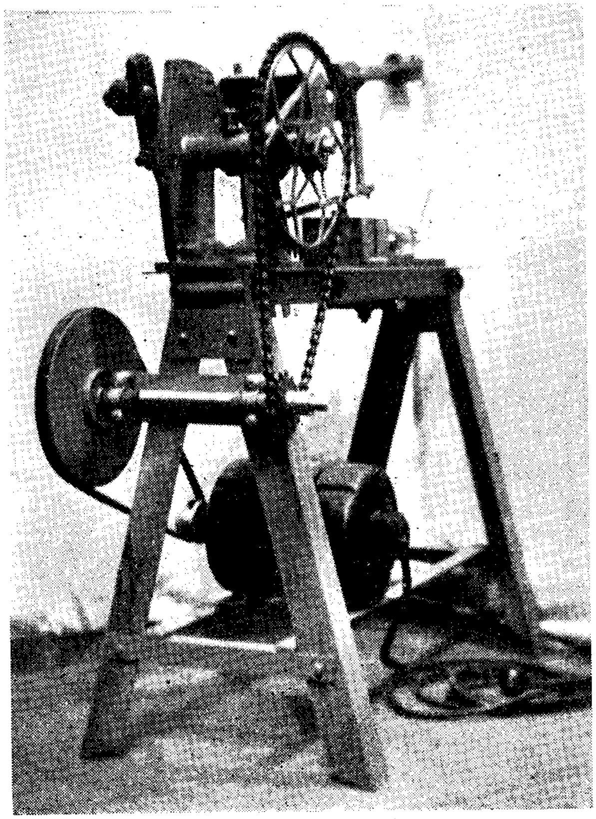
The slide bar is welded on at an angle to give a parallel slide when the saw is running on a level with the top of the vice base, and is also mounted with the flats at 45 deg. to the saw bed. This gives, with the aid of split gunmetal slides, an adjustable action in which wear may be taken up as required.

The slides are of cast gunmetal and are fitted to the saw frame at each end by a single screw, ⅜ in. Whitworth. This enables the saw frame to distort slightly when tension is applied to the saw without any detrimental effect on the sliding action. The two halves of the slide are adjusted by two ¼ in. × ⅝ in. set-screws and lock-nuts.

The saw frame is of black mild-steel 1 in. × ¼ in. and is shaped as a hacksaw frame with 11¼ in. internal length, and 4 in. internal depth, the blade is fixed to the rear of the frame by a small 4 B.A. screw into a protruding plate of ⅛ in. × ¾ in. × ¾ in. and is welded to the frame on one side of the rear leg of the frame so that

photograph. This may be arranged to suit owners' requirements for height, etc.

The saw is driven by a $\frac{1}{4}$ h.p. motor through a countershaft which is mounted on the rear legs and runs in phosphor-bronze bearings mounted in electrical distance saddles $\frac{3}{4}$ in. and fixed to a 7 in. × 2 in. × $\frac{1}{8}$ in. plate of mild-steel. Reduction is from 1,425 r.p.m. to approximately 90 r.p.m. This is as follows: motor pulley, $1\frac{3}{4}$ in., V-belt, $\frac{1}{2}$ in. section to a 7 in. wooden pulley on the countershaft (this pulley was made from $\frac{5}{8}$ in. plywood and has a metal boss screwed to it); from countershaft *via* cycle sprocket wheel, 14 teeth, to gear wheel with crank removed, 52 teeth.



The vice is held to the bed by one single countersunk head $\frac{3}{8}$ in. × $2\frac{3}{4}$ in. bolt and clamping plate, the vice bed is black mild steel 8 in. × 4 in. × $\frac{3}{8}$ in. This is made up with a $\frac{1}{2}$ in. slot running from $\frac{3}{4}$ in. from one end to $\frac{3}{4}$ in. from the other and is 2 in. from one side and $1\frac{1}{2}$ in. from the saw or front side. The bed is bored in a position determined by the vice jaws and the saw blade, so as to give a central position between the two bed rails of the saw. The fixed jaw is held by a single $\frac{1}{2}$ in. × $2\frac{1}{2}$ in. Whitworth bolt in the jaw, and is prevented turning by two Allen socket-screws through the bed from underneath. The moving jaw is fixed by a $\frac{1}{2}$ in. × $1\frac{1}{2}$ in. Whitworth bolt or set-screw through the slot of the vice bed so that the jaw may slide to and fro. This jaw is left free to swivel so as to accommodate uneven shapes, and the back is countersunk in the centre where the end of the jacking-screw engages it. The jaw dimensions are $3\frac{1}{8}$ in. × $1\frac{1}{4}$ in. × 2 in. The jacking-screw is of rolled mild-steel $\frac{5}{8}$ in. Whitworth 8 in. long, with threads for 6 in. The nut is $\frac{5}{8}$ in. Whitworth square and is welded or brazed to the inside of a piece of angle-iron $1\frac{3}{4}$ in. × $1\frac{1}{2}$ in. × $1\frac{1}{2}$ in. This is anchored to the vice bed by one single $\frac{5}{16}$ in. set-screw which allows the screw to swivel in either direction to accommodate the angle of the jaw. The idea of making the jaws so that they can be swivelled, and the vice so that it may also be swivelled, is for cutting angles within certain limits.

Pity the Poor Novice!

In *The Journal of the Society of Model and Experimental Engineers* we find the following extract from what the editor calls his "favourite pamphlet on drawing-office practice":—

"... the sub-assembly can be made interchangeable with all others in the main assembly, but the details of the sub-assembly will not be interchangeable with all others in similar sub-assemblies. In fact, the sub-assembly can rightly be regarded as a detail of the main assembly, since the details forming the sub-assembly do not exist in a finished form until after assembly. The main assembly can therefore still be regarded as an interchangeable assembly."

Nice and clear, is it not? We believe that, if a long breath is taken before making a second attempt at reading the extract, some semblance of meaning *can* be discerned; but we do not like to think what the unfortunate first-year student, encountering it for the first time, would make of it! We also wonder how long an experienced orator would take to learn it so that he could repeat it perfectly, and without notes or prompting. If the rest of that "pamphlet of drawing-office practice" is written in the same style, there can be little wonder that some people would regard it as a "favourite."

We think that we should be able to pick it up and obtain many a chuckle from it, at any time, especially if we felt downhearted; but that could hardly be the intention of its author!

A Shaping Attachment
for the Myford M.L.7 and other Lathes
by "Duplex"

IN the previous article, a description was given of a shaping attachment designed for use with the Drummond lathe so as to operate the topslide from the standard type of toolpost fitted.

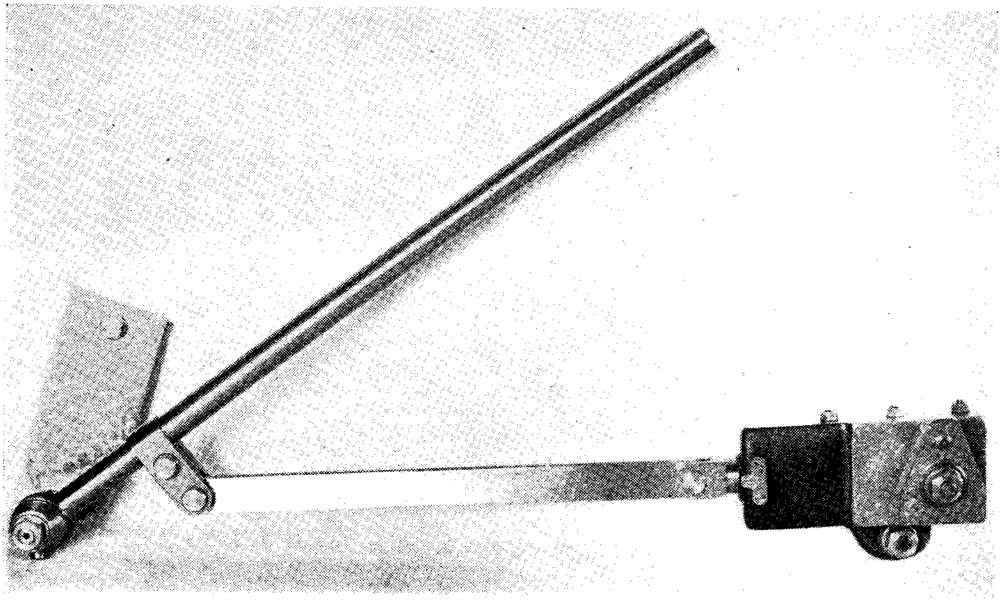


Fig. 1. The shaping attachment assembled

The topslides of other lathes of British make, however, usually have the tool clamp-plate secured by means of a short stud and nut—an arrangement that does not readily provide a fulcrum for operating the slide when a lathe tool is in place.

The first lathe in the workshop to be equipped in this way was a small Winfield lathe of $3\frac{1}{8}$ in. centre height, and it was decided to attach a fulcrum post for the hand lever to the lathe bed, so that the topslide could be moved to and fro by means of a link-rod. As before, the topslide feedscrew is removed and, in its place, a short, forked fitting is bolted to the casting. The complete attachment is illustrated in Fig. 1, and Fig. 2 shows the attachment in place on the lathe.

The Baseplate and Pillar

The baseplate, made of $\frac{1}{4}$ in. or $\frac{3}{8}$ in. mild-steel plate, is fitted with two bolting strips which are filed or machined to fit the shears of the lathe bed.

The pillar for carrying the operating lever must be securely bolted to the baseplate, as the leverage exerted when shaping may subject this joint to considerable strain. The height of the pillar must, of course, be adjusted to suit the centre height of the lathe so that the link-rod, when in place, lies parallel with the surface of the bed.

The Hand Lever and Lever Fork

The lever was made of round material mainly to allow a sliding fork, for attaching the link-rod, to be easily fitted, but this form of lever also gives comfortable working without the need of fitting a separate hand-grip. The head of the lever, which pivots on the pillar, is machined separately and then screwed into place ; a taper pin through the joint will ensure that the lever does not work loose. As shown in the drawing, the lever fork is slit, so that, after being set in the working position, it can be securely clamped to the lever by means of a pinch-bolt.

It should be noted that, when in the correct working position, the fork, through the link-rod, should tend during shaping to press the topslide against the standing V of the base casting and not against the gib strip.

The Link-rod and Topslide Fork

The exact length of the link-rod is not impor-

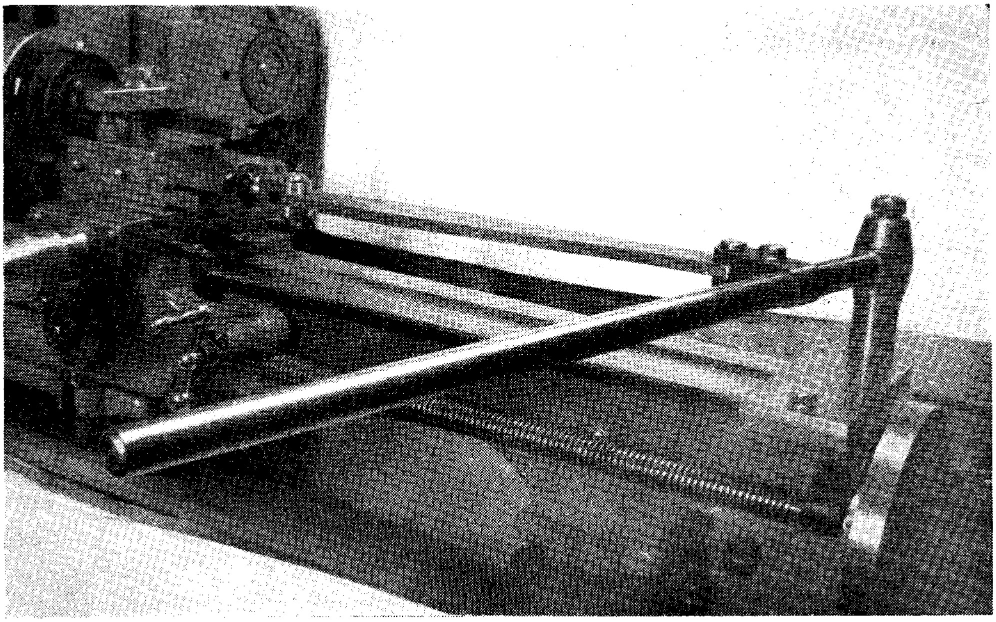


Fig. 2. The attachment in place on the lathe

tant ; but if the rod is much shortened, the angularity will, of course, greatly increase as the stroke is lengthened. When fitted to the small lathe illustrated, the topslide fork is secured in place in the bearing for the feedscrew by means of a nut and washer. To reduce wear, both forks and their joint pins, as well as the two ends of the link-rod, may be case-hardened.

Modifications Required When Equipping the M.L.7 Lathe

As the bed shears of this lathe are of rectangular form, the undercut strips, previously shown for securing the baseplate will not serve and, instead, a plain strip both at the back and front can be fitted. An easier way, perhaps, of fixing the baseplate is that illustrated in Fig. 6. Here, a locating strip is fitted at the back, and the baseplate is secured to the bed by means of the clamp belonging to the lathe's fixed steady. In addition, the pillar must be made to the right height to align the link-rod horizontally.

As will be seen in the accompanying illustra-

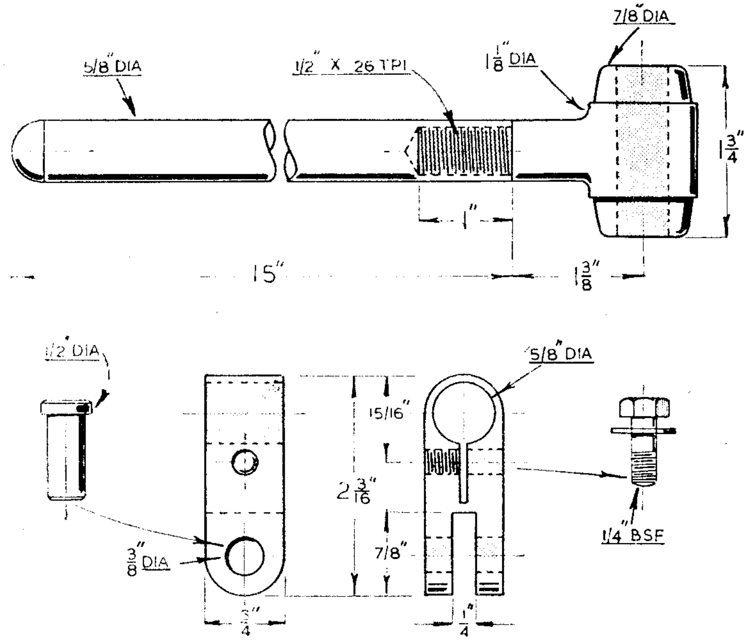


Fig. 3. The hand lever and lever fork

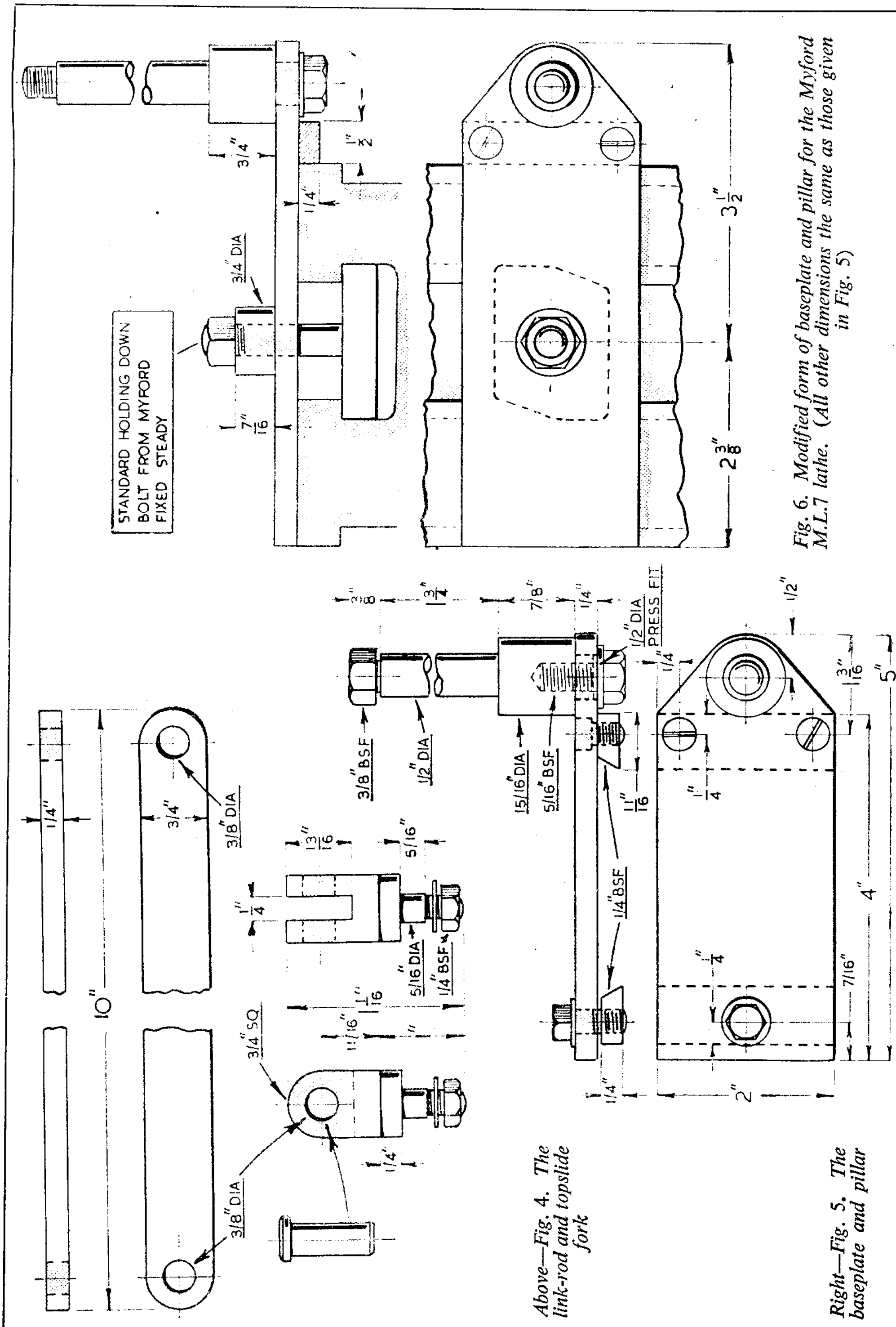


Fig. 6. Modified form of baseplate and pillar for the Myford M.L.7 lathe. (All other dimensions the same as those given in Fig. 5)

Above—Fig. 4. The link-rod and topslide fork

Right—Fig. 5. The baseplate and pillar

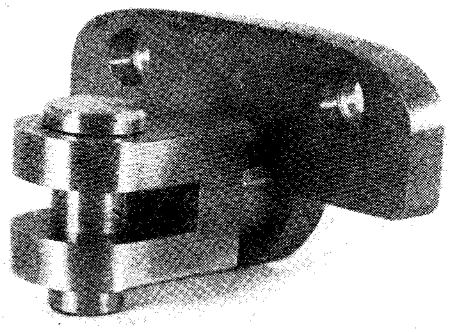


Fig. 7. *The special keep-plate and fork*

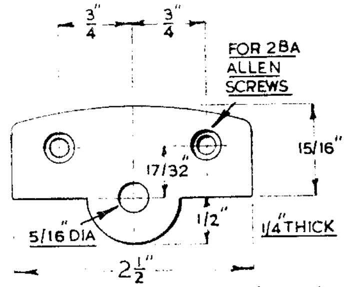


Fig. 9. Dimensions of the keep-plate

tions, a new keep-plate has been fitted to the topslide to carry the fork for attaching the link. The standard form of keep-plate fitted to the lathe is made of special alloy and is of the extended type in order to give a greater range of movement of the slide ; it is, therefore, perhaps advisable not to risk damaging the important feedscrew bearing by bolting the fork directly to the keep-plate casting.

Although two different methods of adapting the lathe for shaping have been described, it is not suggested that these ways are the best ; nevertheless, this equipment has been in use for many years and much useful work has been done ; at the same time, the machines so fitted have not been damaged in any way, nor have any structural alterations been needed.

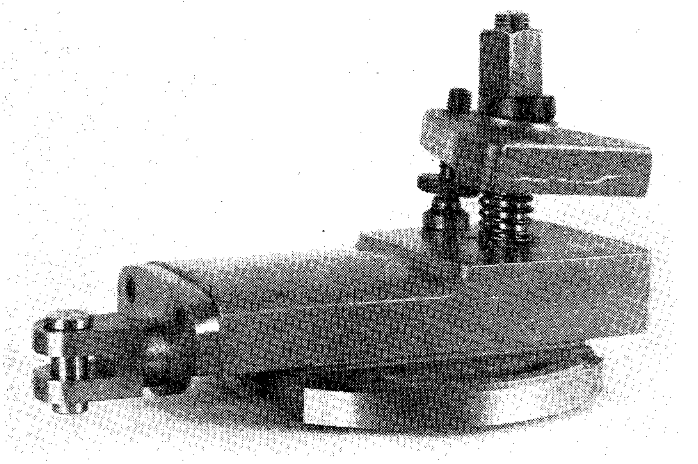


Fig. 8. Myford topslide fitted with fork and keep-plate

The Bromley Regatta

This event deserves special notice as one of the first regattas at which competitions were organised for both free-running and radio-controlled boats.

An entirely new innovation was the " Shipwrecked Mariners " competition, in which floating dolls, weighted so that only the heads showed above water, were fitted with grapnels, and the boats carried a projecting loop so that they could pick up the dolls by coming alongside. A time limit of five minutes was allowed for four rescues. This proved to be a fascintaing contest and much more interesting than the usual round-the buoys obstacle race.

Another event for radio-controlled boats was a balloon-bursting contest in which the boats were armed at the bows with pins, and pursued floating balloons.

The events for free-running boats included a nomination race and a steering competition. A closed nomination race for hydroplanes was also held and a club relay race.

The clubs represented included Blackheath, Welling, Kingsmere, Bromley, South London, Orpington and Victoria. The prizes were presented by Mrs. E. W. Vanner and Mr. W. Cassanet acted as official timekeeper.

Results

Hydroplane Nomination Race
1st. I. D. Savage (Bromley).

Free Running Boats
Nomination Race :
1st. E. W. Vanner (Victoria).
2nd. F. Curtis (Kingsmere).
Steering Competition :
1st. A. A. Rayman (Blackheath).
2nd. P. Petch (Bromley).
Relay Race :
1st. Welling.
2nd. Blackheath.

Radio Control
Rescuing Shipwrecked Mariners :
1st. P. Petch (Bromley).
2nd. Tie between G. Caird (Bromley) and W. Rowe (S. London).
Balloon Bursting :
1st. R. Curwen (Bromley).
2nd. W. Rowe (S. London).

A KEYWAY CUTTING TOOL

by F. G. Bettles

FOR those who intend building model traction engines or thrashing machines, or any gear that requires keyways cut (perhaps even 2, 4 or 8 true and correctly spaced), know it's not an easy job, to set out and file by hand, and be sure they are true with the axis of the mating shaft upon which they have to fit. I know a cutter can be mounted in the toolpost, and the saddle racked along, but when several have to be cut, this is a tedious job, both for operator and the lathe.

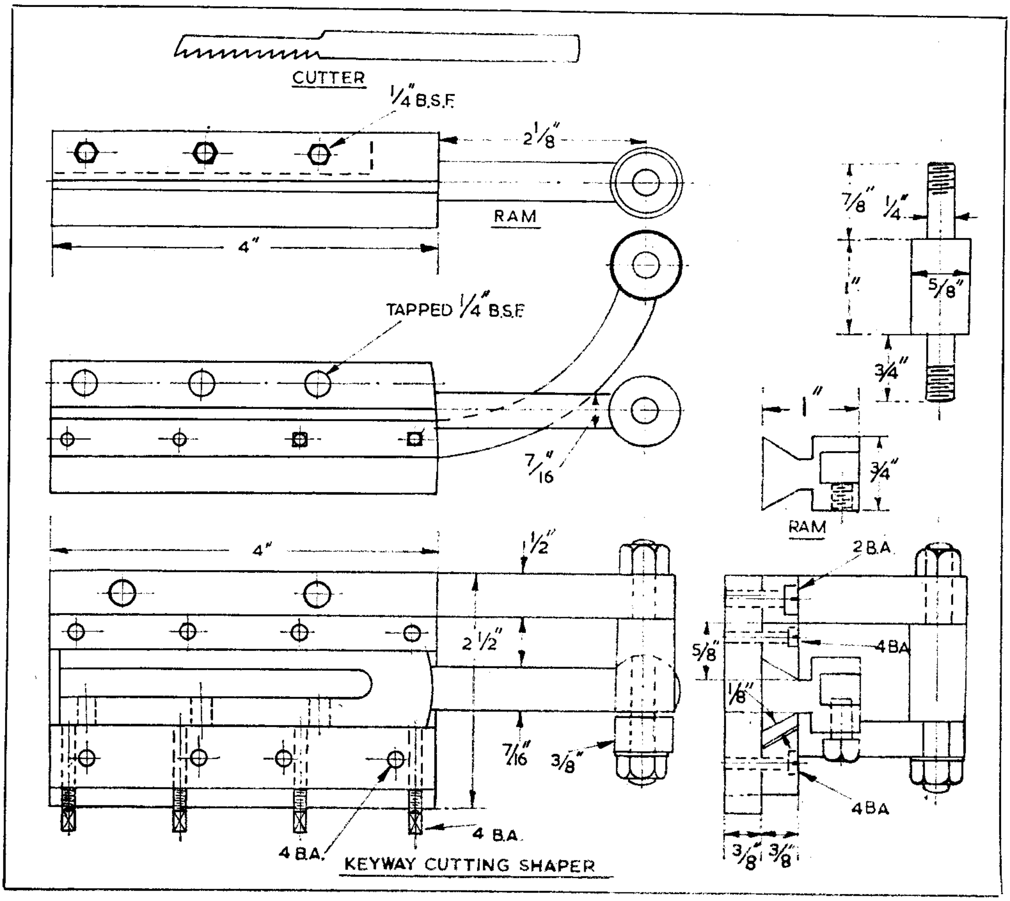
The shaper is mounted on the vertical-slide when in use, so it can be set at any height for work off centre if desired, such as cutting the teeth of small milling cutters, etc.

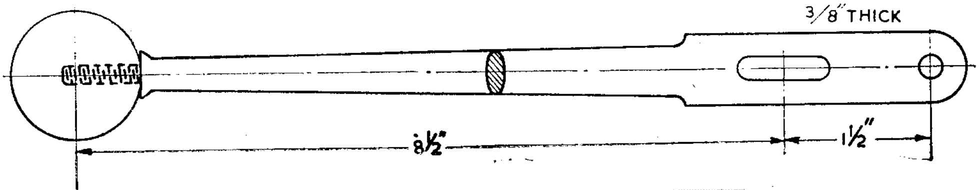
The drawings show the layout and construction. The base can, of course, be a casting, but at the time I made mine, castings were almost impossible to get, so the whole lot was made from odd pieces of mild-steel flat, found lying about.

The ram is best made of mild-steel anyway, as the strain imposed on this is considerable at times; also, the flat strip that carries the end of the operating lever is made $\frac{1}{2}$ in. $\times$ $\frac{3}{8}$ in. section and should have an eye formed on the bent end to carry the short pillar, which in turn, carries the end of the lever, whether a casting or mild-steel base is used.

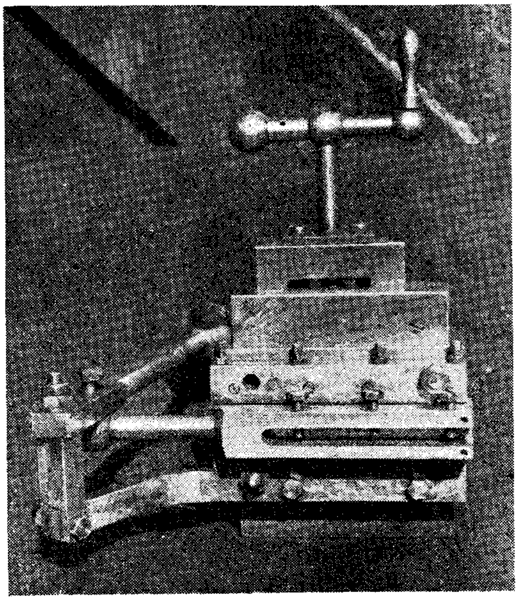
The mild-steel base is $\frac{3}{8}$ in. thick, and should be scraped up true, then the $\frac{1}{2}$ in. $\times$ $\frac{3}{8}$ in. section of the lever bracket should be fixed on to the lower edge of the base, dead true with the edge.

The two 60 deg. pieces can now be made. They depend on your available equipment whether milled, planed or even filed; either is not difficult. The same applies to the ram, except filing, but it could be milled by putting it on an angle-plate, fixed on a vertical-slide, with cutter in chuck of lathe, if nothing else is at hand. The 60 deg. strips are fixed on with a





sunk screw (Allen screw will do fine), but mind you leave room between the ram and the top strip for the ⅛ in. thick adjustable packing strip. The power lever should not be longer than stated, or you might do damage to other parts of the lathe, and don't use too much pressure on the cutters, as nothing is gained by it. I have cut keyways from below $\frac{1}{16}$ in. to $\frac{3}{16}$ in. wide, and on the Burrell gears, eight in one hole, using a division plate to divide up. Cutters are made mostly from smooth files, softened, by putting in a slow fire



when going to bed and leaving all night. After which you can file in the teeth, it is as well to grind off the file cuts, and don't cut the teeth too fine, as a coarse tooth clears the chips better; neither should the cutter be over long. It may be as wide as possible, as long as it clears the plain bore. After filing the teeth, harden and temper to a middle straw (only the toothed end should be hardened). When cutting a keyway, don't let the end of the ram bump the work. You can either cut towards you or away, whichever you can see best.

PRACTICAL LETTERS

Catching 'Em Young

DEAR SIR,—With reference to Mr. J. C. Hall's letter in THE MODEL ENGINEER for July 10th, 1952, I do not claim my son, aged 21 months, to be a model engineer; but when asked what the train does, the reply is "chuff, chuff, CHUFF, chuff," which shows he has an ear for poor valve setting on the B.R. engines which pass our home!

Yours faithfully,

Stockport. K. R. WHISTON.

Electric Clocks

DEAR SIR,—I have noticed several letters from readers regarding Hipp electric clocks and fancied that one in my possession might be of interest. It is a grandfather clock built by my father in 1915. It has a seconds pendulum which pulls on a 15-tooth ratchet which thus revolves once in 30 seconds. This drives the minute hand spindle through a single 1-120 worm reduction. The worm is above the wheel and on the centre-line of the clock. The pendulum is thus offset to one side and swings fore and aft in place of the usual side to side movement. The clock will run for two or three years on two 1½-volt bell batteries in series. When these are new the pendulum will make approximately 36 swings (72 seconds) per contact.

I shall be pleased to show this clock to any interested reader, by prior arrangement.

Yours faithfully,

Bedford. G. A. PICKETT.

The Contractor's Locomotive "Teacup"

DEAR SIR,—In my report on the locomotives at the Northern Models Exhibition, I gave the name of the builder of the locomotive *Teacup* as Mr. J. W. Mercer, of Newton-le-Willows.

This gentleman has kindly written to point out that he did not, in fact, build that engine, and after some enquiries I find that it was actually built by Mr. R. Farrer James, of Chester.

I can only ascribe my error to the supposition that at the time I was making my notes (which was before the exhibition was open to the public, in this case), the name-cards had been switched round accidentally. However, I do apologise most sincerely to the two gentlemen concerned.

Yours faithfully,

"NORTHERNER."

Model Road Racing

DEAR SIR,—I have been reading the article on the above subject in the June 26th issue of THE MODEL ENGINEER. I am very interested in the model G.P., and at home I have a set of plans for the Ferrari.

I was wondering if, as it is possible to make model circuits of actual tracks, it would be possible to have model "hill climbing"?

I have also been thinking about model motor-cycle G.P. but I have not yet thought of a way of making the "machines" bank over, that is on the same style track as the model car G.P.

It has just occurred to me the great possibilities of this method of racing; you could have flat racing for speed records, and with some intricate mechanisms you could have trials.

Yours faithfully,
Bury St. Edmunds. M. W. WARDLE.

An Irish Showman's Engine

DEAR SIR,—In your issue of May 29th, Mr. Edwards mentions that he hasn't seen a showman's engine on the road since before the war. In Ireland we are fortunate in having a few of the fraternity who still favour steam and Mr. Kevin McGivern, one of the best-known showmen in the country, still has three such engines—a Fowler "Super Lion," an Aveling & Porter and a Garrett 5-ton showman's tractor.

On reading the letter I decided to call on Mr. McGivern and try to get a few photographs, and the one reproduced herewith is of the "Super Lion," *Carry On*. It shows Mr. McGivern (in dark suit) and a friend in front of the engine which he has almost finished painting, and I must admit that the photograph gives no idea of the excellence of workmanship at which Kevin is such a past master.

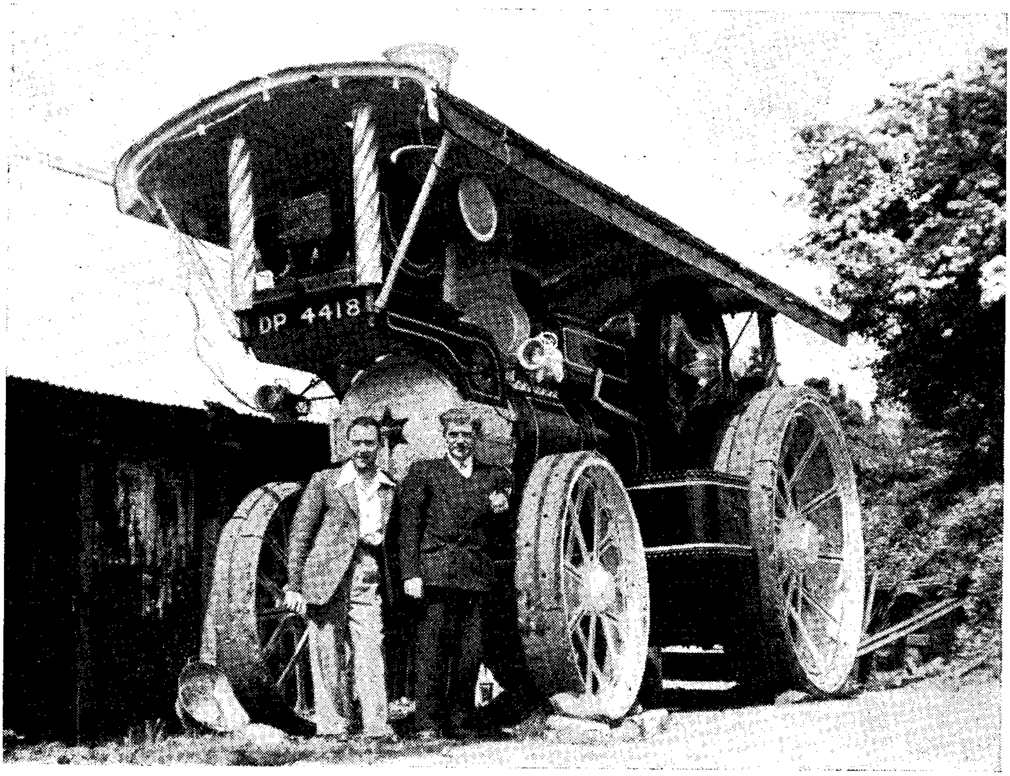
Recently, I was thrilled to see *Carry On*—scarlet boiler, silver smokebox with cream wheels beautifully lined and the signboard "McGivern's Ever Popular Amusements" on the canopy, under full steam pulling eleven wagons on her way to Blackrock for the holiday season. Long may she steam!

Yours faithfully,
Warrenpoint, N. Ireland. HUGH J. HEATLEY.

From the Kitchen Front

DEAR SIR,—I wonder if I may be spared a little precious space in your magazine, to express my thanks to Mr. J. A. Pilkington for his article on the construction of an electric egg whisk, in the August 10th, 1950, issue. The gentleman having by now well outlived his promised "six months of peace," I wonder if any more brainy ideas have since hatched in his brain, for *useful* articles that a workshop can produce?

Since my husband produced the egg whisk for my last birthday, I must confess that I have taken to scanning the pages of THE MODEL ENGINEER (when stirring the porridge, for instance, or when devoid of any more interesting



literature), in the hope that Mr. Pilkington might have been driven to a second effort.

I wish I had seen "Workshop Widow's" article to which Mr. Pilkington referred, for I am sure that we poor wives of model engineers are amongst the most long-suffering of womankind. It is bad enough to be forced to take second place to a lathe, and to see one's husband only at mealtimes (and even then he is likely to bury himself in THE MODEL ENGINEER if given half a chance)—but when he decides to do some braising [*sic*] operations, and lights a coke fire that would roast two or three oxen, on a hot July evening—we are expected to be *grateful* that at least we have his company for one evening! And never does the model engineer's wife experience the normal housewife's wholesome joy and delight at throwing things away. Back they all come from the dustbin—old spaghetti tins, to be cut up to make sleepers for the track—jars, bottles and pots of any size or shape, to house the multitudinous assortment of screws, bolts, etc., that seem to be necessary for his operations—old milk bottle tops to be melted down (in the aforementioned coke fire)—and even her old knitting needles are salvaged, to join the other bits of brass, tin, steel, copper, and whatnot. But again, he has the last word, for the unwanted knitting needles make their appearance long afterwards, as the "blades" (or are they "paddles"?) of the egg whisk. (Anyway, I mean the parts that do the work, as far as the inexperienced eye can see.)

So come on, all you partners-in-crime, join Mr. Pilkington in his "Save the Peace at Home" campaign, and see what next you can invent for your well-deserving wives!

Yours faithfully,

Rawtenstall. KATHLEEN HOWORTH (MRS.).

Pendulum Swing

DEAR SIR,—With reference to E.D.'s query No. 9955, in your issue of May 1st, 1952, *re* pendulum swing, perhaps I can be of assistance, if not too late.

If he insists upon retaining the ball-bearing suspension, then he should have the pendulum attached to a shaft with a ball-bearing at each end of the shaft, spaced, say, $\frac{3}{4}$ in. apart. The pendulum should not be rigidly attached to the shaft but should be attached with a swivel so that there is a backwards and forwards movement but no twist. This will prevent the pendulum rolling.

The trouble he is experiencing with the armature clamping down on to the pole-pieces is probably due to the fact that the contacts are remaining closed too long. They should break just before the armature reaches the pole-pieces, then the gap could remain at 0.006 in. This distance is not critical.

Yours faithfully,

Johannesburg, S.A. V. E. FREEMAN.

CLUB ANNOUNCEMENTS

Lymington and District Model and Engineering Society

We are holding our annual model engineering exhibition at the Community Centre, New Street, Lymington, from Wednesday, August 27th until Saturday, the 30th. Open 2 p.m. until 9 p.m. Wednesday, Thursday and Friday, Saturday 11 a.m. until 9 p.m. The club passenger-carrying railway will run on Thursday and Friday evenings and all day on Saturday.

Hon. Secretary: T. G. CRABBE, "Hurst Cottage," Wainsford Road, Pennington, Lymington.

P.A.D.S.M.E.E.

At the recent monthly meeting of the above, the society's president gave a lecture on "Radio Control of Models," this very interesting talk being illustrated with a practical demonstration of radio control in the form of a scale model of H.M.S. *Vanguard* constructed by Mr. Tucker himself; all the principal operations of this vessel, including firing the guns, can be carried out by radio control up to a distance of over a mile.

Arrangements are in hand for the society to visit Luckett Mine and also a Cornish engine in the Camborne-Redruth area; several shorter trips to local places of interest, including the new power station, are also planned. This programme will fill the season right up to October when the society's fourth bi-annual exhibition will be held.

Hon. Secretary: J. HAMMOND, Hill House, Hannafore, Looe, Cornwall.

The Isle of Wight Model Engineering Society

This society will be holding its annual exhibition at the Vectis Hall, Ryde, I.W., from Saturday, August 23rd to August 30th. We will be pleased to welcome all model engineers who may be on holiday in our garden isle during that period, and also any models or bits and pieces they might care to bring along. The hall is quite close to the front and the Esplanade Station.

Our portable track and locomotives have now started the season, operating in various parts of the island and will be on active service at the exhibition along with other interesting features. Particulars of the exhibition may be obtained from the Hon. Secretary: V. C. RICHARDS, "Pan Y Lan," Park Road, Wootton, I.W.

The Wallasey Model Power Boat and Yacht Club

An open regatta will be held on Sunday, August 17th, 1952, in Central Park, Wallasey. The regatta will commence at 11 a.m. and there will be "A," "B," "C" and "D" class hydroplanes, and steering and nomination events.

A cordial invitation is extended to all clubs to attend.

I would appreciate a post card from intending competitors stating the events they intend entering. Light refreshments will be available at the club's boathouse.

Hon. Secretary: H. A. JACKSON, 21, Deveraux Drive Wallasey.

Welling and District M.E.S.

The future fixtures of the above society are as follows:—
August 8th and 22nd. Informal meetings. Welling Library.
August 31st. M.P.B.A. Grand Regatta, Victoria Park.
September 5th. "Bits and Pieces" Night.
September 14th. Kingsmere Regatta, Putney.
September 19th. Discussion on locomotive design.
September 21st. Southend Regatta. The society has hired a coach for this event, and there are still some seats going spare. First come, first served. Cash in advance. Apply Secretary, J. A. KING, 309, Days Lane, Sidcup, Kent. Bexley Heath 5872.

Perranporth and District Model Engineering Society

The above society are holding their annual exhibition in the Market Hall, Redruth, on August 30th, to September 6th, both dates inclusive. Further particulars may be obtained from the Exhibition Secretary, F. HARVEY, "Veronica," Perranporth.

Hon. Secretary: W. J. BAKER, St. Pirans Road, Perranporth. Telephone 3243.